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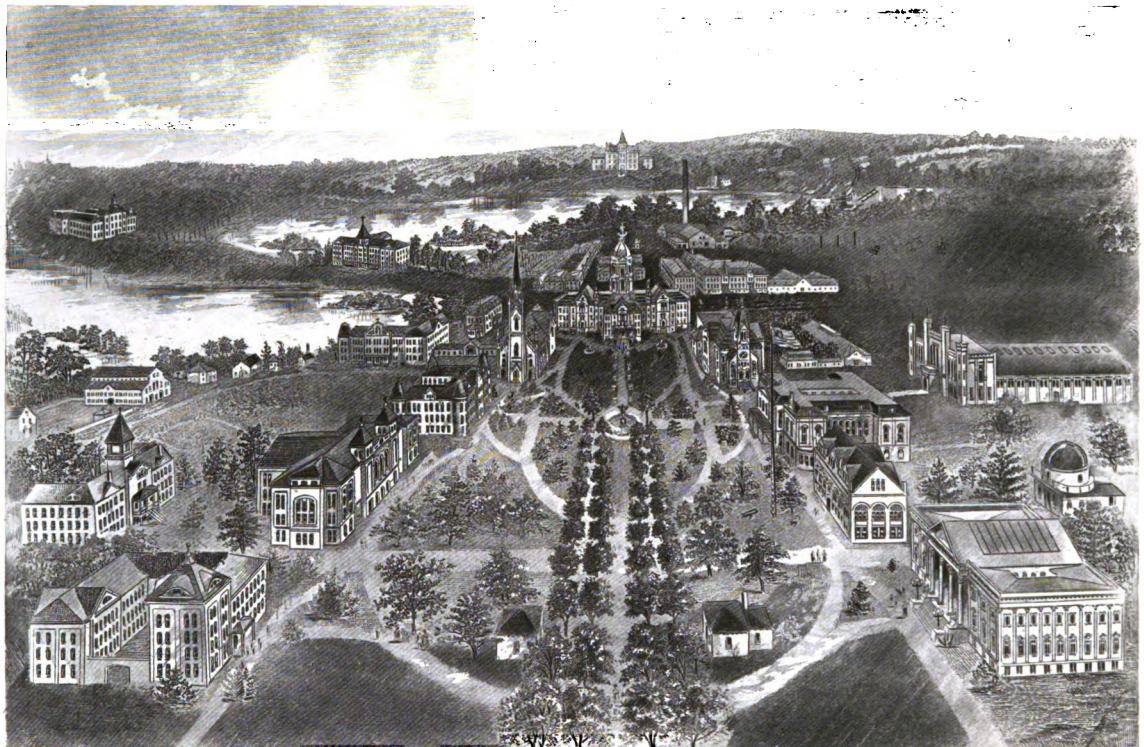

UNIVERSITY OF NOTRE DAME
Notre Dame, Indiana

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Series IV. Number 1.

BULLETIN

OF THE

University of Notre Dame

NOTRE DAME, INDIANA

GENERAL CATALOGUE

1907-1908

PUBLISHED QUARTERLY AT NOTRE DAME

THE UNIVERSITY PRESS
JULY, 1908

Entered at the Postoffice, Notre Dame, Indiana, as second-class matter, July 17, 1905.

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DIRECTORY OF THE UNIVERSITY

The FACULTY—Address:
THE UNIVERSITY OF NOTRE DAME,
NOTRE DAME, INDIANA.

The STUDENTS—Address:
As for the Faculty, except that the name of the HALL in which the student lives should be added.

A Postoffice, a Telegraph Office, a Long Distance Telephone, and an Express Office are at the University.

The University is two miles from the city of South Bend, Indiana, and about eighty miles east of Chicago. The Lake Shore and Michigan Southern, the Grand Trunk, the Vandalia, the Indiana, Illinois & Iowa, the Chicago and Indiana Southern, and the Michigan Central railways run directly into South Bend. A trolley line runs cars from South Bend to the University every fifteen minutes.

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CALENDAR FOR 1908-09

1908.		
SEPTEMBER	8, 9, 10.	Entrance Examinations.
	11.	Preparatory School opens.
	18.	Colleges open.
	20.	Reading of University Regulations in all the Halls.
OCTOBER	1.	Examinations of Conditioned Students.
	13.	Founder's Day. No classes.
	29.	Annual Retreat begins in the evening.
NOVEMBER	1.	Feast of all Saints. No classes.
	2, 3.	Bi-Monthly Examinations.
	26.	Thanksgiving Day. No classes.
DECEMBER	5.	The William P. Breen Medal Orations.
	8.	Feast of the Immaculate Conception. No classes.
	1.	President's Day. No classes.
	17, 18.	Bi-Monthly Examinations.
	19.	Christmas Vacation Begins.
1909.		
JANUARY	5.	Colleges open.
FEBRUARY	7.	State Oratorical Contest.
	22.	Washington's Birthday. No classes.
	26, 27.	Bi-Monthly Examinations.
	17.	St. Patrick's Day. No classes.
	19.	St. Joseph's Day. No classes.
APRIL	11.	Easter. No Easter Vacation.
	12.	Easter Monday. No classes.
	26, 27.	Bi-Monthly Examinations.
MAY	20.	Latest Date for handing in Prize Essays and Graduating Theses in all the Colleges.
	30.	Decoration Day. No classes.
JUNE	1.	The Joseph A. Lyons Medal Recitations. The Patrick T. Barry Medal Recitations.
	7, 12.	Examination of Candidates for Graduation.
	13.	Baccalaureate Sermon.
	14, 15.	General Examinations.
	16.	Commencement. Bachelor's Orations. Commencement Address, 8:00 P. M.
	17.	Graduation Exercises, 8:00 A. M.

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Director of the Department of Music.

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Latin.

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Piano.

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History and Librarian.

DAMIS PAUL,
Piano and Violin.

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Economics.

TIMOTHY EDWARD HOWARD, A. M., LL. D.,
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Drawing.

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Electrical Engineering and Physics.

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Mechanical Engineering.

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Mathematics.

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Law.

MICHAEL J. SHEA, A. M.,
Latin.

ARTHUR LUCIUS HUBBARD, A. M., LL. D.,
Law.

ROBERT LEE GREEN, PH. G.,
Pharmacy and Pharmacognosy.

SHERMAN STEELE, LITT. B., LL. B.,
Law.

CHARLES PETERSEN, A. M.,
German.

* Leave of absence during 1907-'08.

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Parliamentary Law and Debating.

WILLIAM E. FARRELL, A. B.,
Elocution.

ROLLAND ADELSPERGER, A. B.,
Architecture.

EDWARD HERMANN SCHWAB, LL. M.,
Law.

ARTHUR FUNK, B. S.,
Physics.

JOSEPH A. DWAN, M. E. E. E.,
Assistant in Physics and Electricity.

JOSEPH LANTRY, C. E.,
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JOSEPH SINNOTT, M. E. E. E.,
Electricity.

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WILLIAM BUDD KELLEY,
Shopwork.

BERTRAM G. MARIS,
Director of Gymnasium.

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UNIVERSITY OF NOTRE DAME

The University of Notre Dame was founded in the year 1842, by the Very Reverend Edward Sorin, the late Superior General of the Congregation of Holy Cross. In an act approved January 15, 1844, the Legislature of Indiana gave the University power to grant degrees. The beginning of this act is:

"Be it enacted by the General Assembly of the State of Indiana, that Edward Frederick Sorin, Francis Lewis Cointet, Theophilus Jerome Marivault, Francis Gouesse and their associates and successors in office, be, and are hereby constituted and declared to be, a body corporate and politic, by the name and style of the 'University of Notre Dame du Lac,' and by that name shall have perpetual succession, with full power and authority to confer and grant, or cause to be conferred and granted such degrees and diplomas in the liberal arts and sciences, and in law and medicine, as are usually conferred and granted in other universities in the United States, provided, however, that no degree shall be conferred or diplomas granted, except to students who have acquired the same proficiency in the liberal arts and sciences, and in law and medicine, as is customary in other universities in the United States."

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UNIVERSITY BUILDINGS

THE ADMINISTRATION BUILDING

The dimensions of this building are 320 by 155 feet; it is five stories in height and is surmounted by a dome 207 feet in height. The executive offices, two study-halls, some dormitories and class rooms and the dining-rooms are in this building. The Library and the Bishops' Memorial Hall are also here temporarily. This building, like all the others of the University, is lighted by electricity and gas, and heated by steam. The corridors of the first floor are decorated with mural paintings by Gregori.

THE CHURCH

The Church of the Sacred Heart is 275 by 120 feet in ground dimensions and 125 in height from the floor to the roof-ridge. The interior is decorated by Gregori, and the architecture is Gothic. There is a large crypt and many chapels. In the tower is a chime of 32 bells and the great six-ton chief bell.

THE LIBRARY

The Library contains 55,000 volumes and several thousand unbound pamphlets and manuscripts. The departments of literary criticism, history, political science and the Greek and Latin classics are well represented. Special libraries containing reference works on technical subjects are provided in the Colleges of Engineering and Science. The College of Law has a complete library of its own. Ample reading room is provided in the main library. The best literary magazines and reviews, as

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well as the current numbers of scientific and technical journals are kept on file. Students have access to the Library from 8:00 A. M. to 9:00 P. M.

WASHINGTON HALL

This hall is 170 feet in length, 100 feet in width, and about 100 feet in height. It contains the rooms of the Department of Music, the reading rooms for Brownson and Carroll Halls, and the University Theater. The Theater is elaborately equipped with stage settings. It will seat 1,200 persons. Lectures by men eminent in public and professional life are given here. Concerts and plays by professional companies are also presented in this theater. The dramatic clubs of the University present five plays annually.

SCIENCE HALL

is situated a few steps south of Washington Hall. Its dimensions are 105 by 131 feet, and it is three stories in height. A large central space, the full height of the building, is occupied by a museum containing mineral, fossil, and biological specimens. The departments of Physics, Electrical Engineering, Civil Engineering, Philosophy, Botany and Biology have recitation rooms and laboratories in this building. The equipment for each of these departments is extensive and complete. Description of the equipment will be found later in this catalogue.

THE MUSEUM

connected with the departments named above, is well arranged for convenience of study. The zoological collection on the second floor at present fills sixteen large cases and represents typical forms of all the orders and

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genera of vertebrate and invertebrate animals. A large collection of representative vertebrate skeletons forms a considerable part of the Museum.

The botanical collection, also on this floor, consists of two complete Herbaria, one of the United States, the other of Canada. There is also a second collection of the woods and fruits of the United States, almost complete.

The collections in Geology and Mineralogy occupy the first floor. These collections are arranged in a series of cases on each side of the building. In one series is a carefully classified collection of minerals and ores. The opposite series of cases contains a large geological collection; some of the specimens here are of the rarest fossil remains of animal and plant life.

THE CHEMICAL LABORATORIES

occupy a large three-story building directly south of Science Hall. The entire first floor is devoted to advanced work and space is given to three large laboratories, a library and lecture rooms. The second floor is occupied by the Department of Pharmacy, and contains a large, well-equipped laboratory, a modern drug store, a lecture room and museum, a library for pharmaceutical publications, and a general stock room. The general inorganic, organic and elementary chemical laboratories are on the third floor. Each laboratory is provided with ample hood accommodations, and each desk is furnished with water, gas and suction.

ENGINEERING HALL

This building is situated in the southern part of the grounds and is a large two-story brick structure, well lighted and heated. The lower floor contains the me

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chanical laboratory, machine shop, blacksmith shop and foundry. The second floor provides the shop for wood work and also contains a well lighted drawing room where students in designing may consult complete working drawings of the best steam engines and pumps to be found on the market.

THE OBSERVATORY

This building is located near the Chemical Laboratories and is designed for an equatorial telescope and for a transit or meridian circle. The equatorial telescope now in the building is intended for students of astronomy, and is in use whenever favorable weather permits.

SORIN HALL

This building is 144 feet in length, with two wings 121 feet in depth. It has a basement and three high stories, and contains 101 private rooms for advanced students. These rooms are furnished, and students of Senior, Junior, or Sophomore, standing in any of the Colleges are not required to pay rent. On the first floor there is a chapel, a law lecture room and a law library. The building is lighted with electricity and heated with steam. In the basement are recreation rooms and bath rooms.

CORBY HALL

Corby Hall is a second residence building. It has three stories and a basement, and it is 240 feet in width. There are 125 private rooms for students, with recreation rooms and a chapel. The building is lighted with electricity and gas and heated with steam. For room-rent and care of the room a fee is charged.

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BROWNSON HALL

Brownson Hall occupies the east wing of the Administration Building and contains the living and study rooms of Preparatory students of seventeen years of age and upwards. There is a common study hall, a common lavatory, and two large sleeping rooms in which each student has an alcove curtained to secure personal privacy. Experience shows that the discipline of these common rooms works admirable effects on students who have not yet contracted solid habits of study.

CARROLL HALL

Carroll Hall is in the west wing of the Administration Building. It is in all respects similar to Brownson Hall, except that it is intended for younger students. The regulations are more particularly adapted to their age and scholastic attainments. Preparatory students between the ages of thirteen and seventeen years are placed in this hall.

ST. JOSEPH'S HALL

St. Joseph's Hall is located at the extreme southwestern end of the campus and is devoted exclusively to living and study rooms. In this building live those students who defray one-half the cost of board and tuition by waiting at table during the meals. The conditions for admission to this hall are: (1) The payment of two hundred dollars ($200.00) a year on the first of August, and (2) satisfactory service as a waiter. The waiting in no wise interferes with the student's work, and all the educational advantages are open to him. It is to be regretted that through the lack of endowment the University can offer only a limited number of such opportunities each year. It is necessary to apply early for these appointments.

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THE INFIRMARY

This building, 200 feet by 45 feet in ground measurement and three stories in height, contains rooms for the use of students during illness. The sick are cared for by Sisters of Holy Cross, and the University physician visits them daily.

THE GYMNASIUM

The Gymnasium which was burned down in November, 1900, was replaced by a building 230 by 200 feet in dimensions. The track-hall is now 100 by 180 feet on the ground; it is used for indoor meets, winter baseball practice, basketball and military drill. The gymnastic hall is 100 by 40 feet and is furnished with a full set of apparatus; below that are the offices, dressing-rooms and shower-baths. Friends of the University and the alumni contributed more than three thousand dollars to the fund for rebuilding.

Cartier Field is an enclosed field for athletic games. There is a permanent grand stand near the baseball diamond and the running track, and a portable stand near the football rectangle. The field contains ten acres of ground, and is a gift to the University from Mr. Warren A. Cartier, C. E., of the class of '87.

OTHER BUILDINGS

There are numerous other large buildings connected with the University, Holy Cross Hall, Dujarie Hall, the Community House, the Presbytery, and Saint Edward's Hall.

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SYSTEM OF INSTRUCTION

The entire plan of studies is based on the modified elective system. The student is free to select his own curriculum conformably to his natural liking, the career in life he may have in view, or the determinate intellectual bent developed during his secondary school years; but, though he is free to elect his own studies, he has not, however, unlimited freedom in this respect. The principle of general election is modified. Lest the young Freshman in his inexperience choose unwisely, he is aided in making his choice of studies by being permitted to select from among a number of parallel programs leading to baccalaureate degrees. Sixteen programs are open for his choice in the Colleges, each embracing courses which, in the opinion of the Faculty, contribute best to cultural, scientific or professional knowledge. These programs are, in some cases, made elastic by the introduction of elective courses, especially in the Junior and Senior years. Students who wish to spend a limited time in study and cannot complete all the courses in a program for a degree may register as special students and elect any courses for which their preparation has fitted them.

The hours scheduled in the different programs are credit hours based on the average amount of time required for attendance at recitations and the time necessary for preparation of recitations. One hour of recitation is regarded as the equivalent of two hours of laboratory work. The minimum number of credit hours which a student must carry is sixteen, the maximum number which he may carry is twenty. Students who wish to take more work than is indicated by the maximum requirements must apply by formal petition to the Faculty for the requisite permission.

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REGULATIONS GOVERNING ADMISSION TO THE COLLEGES

Candidates who wish to enter any of the Colleges must present evidence, either by examination or by a properly attested certificate, of ability to enter on the courses of the Freshman year. The specific subjects required for entrance will be found later in this catalogue.

Examinations in all the subjects required for admission to the University are held at Notre Dame in September, at the beginning of the Fall Term and in January at the beginning of the Spring Term.

A candidate failing to pass satisfactory examinations in one or more of the subjects required for admission to any college program may, at the discretion of the Faculty, be admitted to his class conditioned, to make up his deficiency by extra study *within one school year.* Only when the conditions are removed will the student be admitted to full standing in his class.

Graduates of High Schools that are *fully accredited* to the State Universities, will be admitted without examination to the Freshman year of any program to which their preparatory studies entitle them.

Certificates of work done in public High Schools or in private Preparatory Schools will not be accepted instead of examinations, unless the applicant has passed the final examinations after full courses in his school, and the Faculty of the University are satisfied with the standing of the school.

Candidates for admission to advanced standing who are required to take examinations must pass, *in addition* to the usual entrance examinations, an examination in the work already done by the classes they desire to enter.

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The additional subjects may be found in the several programs of studies described later in this catalogue.

Applicants for advanced standing who present certificates from other colleges or universities may be received at the discretion of the Faculty with or without examination as regards particular cases.

No student will be admitted to any course of the Senior year until all conditions have been cancelled.

Catholic students are required to take the prescribed courses in Evidences of Religion.

DEGREES

Degrees are conferred only on regular students who have satisfied the full entrance requirements and have completed satisfactorily the courses prescribed. The courses required for the several degrees conferred by the University will be found described later in this catalogue. Written theses and final examinations are demanded of all candidates for degrees. One full scholastic year of resident study is absolutely required.

BACHELORS

The courses of study offered to candidates for the degree of Bachelor extend by fixed programs through four scholastic years. In the College of Letters and Arts one of three degrees is conferred on an undergraduate—Bachelor of Arts (A. B.), Bachelor of Letters (Litt. B.), Bachelor of Philosophy (Ph. B.)—dependent on the special program of studies the candidate selects. The College of Science offers five degrees for choice to undergraduates—Bachelor of Science (B. S.), Bachelor of Science in Biology (B. S. Biol.), Bachelor of Science in Chemistry (B. S. Chem.), Graduate in Pharmacy (Ph. G.), Pharmaceutical Chemist (Ph. C.). The College of

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Engineering offers three degrees—Civil Engineer (C. E.), Mechanical Engineer (M. E.), and Mechanical Engineer in Electrical Engineering (M. E. E. E.). Two degrees are offered by the College of Architecture —Bachelor of Science in Architecture (B. S. A.), and Bachelor of Science in Architectural Engineering (B. S. A. E.). The College of Law offers the degree of Bachelor of Laws (LL. B.). In the College of Music one degree is offered, Bachelor of Music (B. M.). In order to obtain this degree the candidate must have studied music in the University for one complete year. He must have a thorough theoretical knowledge of four instruments mentioned in the courses described later, and a practical mastery of one of them. He shall pass a written examination in harmony, counterpoint and composition, and he must submit to the examiner two original compositions: (a) A fugue for full orchestra, or for four voices with independent orchestral accompaniment; (b) a composition in the free form (sonata or rondo) for pianoforte, or a trio (pianoforte, violin and violincello).

The degree of Bachelor will not be conferred unless the candidate shall have been in residence for one complete scholastic year in his *Senior* year of study.

MASTERS

The degree of Master is open to students who have received the degree of Bachelor from Notre Dame or from some other college in good standing, and who make application to the Committee of the Faculty on Graduate Study for the privilege of pursuing advanced work. All work must be approved by this Committee. One year of residence, at least, is required of candidates who have received their Bachelor's degree at another college. Those who have received their Bachelor's degree from

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Notre Dame, may, in some cases to be determined by the Committee, obtain the Master's degree for work done *in absentia*.* One major and one or two minor courses will constitute the curriculum, forming a consistent, coordinated plan of advanced work pursued with some definite aim. On completion of the required work the candidate must pass a satisfactory examination in writing under the professors who give his subjects of instruction. The candidates for this degree must also write a dissertation of notable merit on some topic connected with his major subject, the thesis to contain in the minimum five thousand words. The subject of the thesis must be announced to the Committee by December 1, and submitted for examination by May 15. Five printed or typewritten copies of the thesis must be presented to the University to be placed in the library. The fee for examination of work done *in absentia* is twenty-five dollars. The fee for this degree is fixed at fifteen dollars.

DOCTOR OF PHILOSOPHY

Three years must be spent by the candidate in University work before the degree of Doctor shall be conferred,—two of these years must be spent at Notre Dame and one may be passed in some other university on approval of the Committee of the Faculty on Graduate Study. The candidate must pass satisfactory examinations in French and German on entrance. The work for the degree shall consist of one major and two minor courses of instruction approved by the Committee. Research study shall form the most important part of the candidate's work. On completion of his work the candidate must pass minute examinations on the three subjects of his curriculum and must defend his disserta-

**No degree is conferred in honorem except the degree of Doctor of Laws, (LL. D.).*

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tion before the whole Faculty. The thesis must be printed and one hundred and fifty copies presented to the University. A copy of the thesis must be handed to the Committee one month before the examinations. The degree will not be conferred for merely faithful work, and not for miscellaneous study, but for original research and for high attainment in one branch of study. The fee for this degree is fixed at twenty-five dollars.

SPECIAL STUDENTS

Students who do not wish to become candidates for a degree by following the prescribed courses of any program may register as special students and attend any of the courses of instruction for which their previous academic training has fitted them. Such special students are governed by the same regulations and discipline as the other undergraduates. They are required to pass the same examinations in the courses they pursue as the other students. In exceptional cases men of mature age, who have been out of school or college for several years, but whose training in practical affairs has been sufficiently educative, will be accepted as special students by satisfying the Faculty of their ability to pursue with profit any course of instruction.

On leaving the University special students may receive on application certificates stating their proficiency in the courses they have pursued.

SCHOLARSHIPS

The University has at present only four foundations which yield revenues for the support and tuition of four students annually. Assignment of these scholarships is made under restrictions indicated with each gift. No student will be continued in the enjoyment of a scholarship whose superiority in college work is not clearly indicated in his first year of residence. Nor will a

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student who has incurred serious censure by breach of the regulations of the University be considered again as a candidate for a scholarship.

It is a matter of great regret that the lack of endowment makes it impossible for the University to give place to a greater number of deserving students who are not able to pay the charges of board and tuition. Under conditions indicated on page 16 of this catalogue a limited number of student-waiters can be received at reduced rates. Certain clerkships in the University offices and positions in the libraries are also open to worthy students. Information regarding the assignment of these places will be furnished by the President. The University is doing all in its power to assist students in narrow circumstances. The friends of Notre Dame are asked to assist in this work.

THE JOHNSON SCHOLARSHIP

In 1899 Dr. Edward Johnson, of Watertown, Wisconsin, gave a fund of four thousand dollars, the income of which aids in the support of one student annually. By the terms of the gift assignment is made only to a student who intends to enter the priesthood.

THE CARROLL SCHOLARSHIP

The Reverend Thomas Carroll, of Oil City, Pennsylvania, bequeathed five thousand dollars in 1899. The terms of the bequest specify that the income shall be used to aid a student from Oil City.

THE FORD SCHOLARSHIP

In 1900 Mrs. Catherine Ford, of Chicago, gave to the University certain properties for the maintenance of worthy students. The income arising from this gift now supports fully two students annually. By the wish of the donor nominations for these scholarships are made from St. Jarlath's parish, Chicago.

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PRIZES

The following prizes and honors within the gift of the University are awarded annually under conditions named below. Any of these prizes may be withheld by the Faculty if the student incur serious censure for violating any of the regulations of the University.

THE QUAN MEDAL FOR CLASSICS

A gold medal is yearly given to the student who has obtained the best record in the Senior year of the Classical Program. The medal is the gift of Mr. William J. Quan, of Chicago, and is awarded only on condition that the record of the student is notably good in all the courses of instruction prescribed for the Senior year.

THE MASON MEDAL FOR CARROLL HALL

A gold medal, the gift of Mr. George Mason, of Chicago, is awarded each year to the student of Carroll Hall whose scholastic record is superior to that of his fellows. Observance of the University regulations counts in the award. The prize may be withheld if in the opinion of the Faculty the record of the student has not reached a high standard.

THE MEEHAN MEDAL FOR ENGLISH ESSAYS

A gold medal, the gift of Mrs. Eleanor Meehan, of Covington, Kentucky, is awarded every year to the undergraduate who presents the best dissertation in English. Essays offered in competition may be on any subject approved by the head of the Department of English. Those offered for graduation may be presented in competition. The Faculty will not award the prize, if, in the opinion of the judges selected, the best essay is not notably meritorious.

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THE BREEN MEDAL FOR ORATORY

This prize is the gift of the Honorable William P. Breen, of the Class of '77, and is annually awarded to the student who excels in oratory. The award is made by a committee of three selected by the Faculty and after a public competition. The winner represents the University in the Indiana State Oratorical Contest held the first Friday in every February. No student may receive the Breen Medal more than once, but the winner of this prize may compete again for the honor of representing the University in the State Contest.

ELLSWORTH C. HUGHES MEDAL FOR CIVIL ENGINEERING

A gold medal presented every year by Mr. A. S. Hughes, of Denver, Colorado, in memory of his son, who was a member of the Sophomore Class in 1889, is awarded to the student of the Department of Civil Engineering who has obtained the best record in all the courses prescribed in the program. The medal is awarded only when the student's record has attained a fixed standard. In computing the grade the courses in mathematics count fifty per cent. Only students who have been in residence for four full years are eligible to compete for this prize.

THE MEDALS FOR ELOCUTION

Two prizes known as the Joseph A. Lyons Medal and the Patrick T. Barry Medal are awarded every year for excellence in elocution. The award is made after competition in public. In order to be eligible to compete, students must have followed at least two of the courses of instruction in public speaking. One of the medals was founded in memory of Professor Joseph A. Lyons, of the Class of '62, who served the University as Professor of Elocution and Oratory from 1872 to 1888. The other is the gift of Mr. Patrick T. Barry, of Chicago.

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THE PRIZE FOR PUBLIC DEBATING

A prize of seventy-five dollars, given every year by Mr. J. V. Clark, of Chicago, in memory of his father, is awarded to three students who in the opinion of a committee selected by the Faculty excel in debating. The award is made after a competition in public. The prize is divided, thirty-five dollars going to the student who receives the highest marks, twenty-five dollars to the second, and fifteen dollars to the third. The three students who are successful in the competition represent the University in the principal intercollegiate debate of the year.

DISCIPLINE

Official reports of each student's class standing will be sent to parents and guardians every two months.

The Faculty maintain that an education which gives little attention to the development of the moral part of a youth's character is pernicious, and that it is impossible to bring about this development where students are granted absolute relaxation from all Faculty government while outside the class-room. A young man must learn obedience to law by the actual practice of obedience, not merely by appeals to honor.

Moreover, the quiet and concentration of mind that are needed for college work are not obtained except where discipline exists.

Therefore the following regulations, shown by experience to be salutary, are enforced at the University:

1. No student shall leave the University grounds without permission from the President or the person delegated to represent him.

2. Leave of absence will not be granted to students during the term time, except in cases of urgent necessity. There is no vacation at Easter.

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3. Students are required to report at the University immediately after arriving at South Bend. This rule is binding not only at the beginning of the scholastic year, but at all other times when leave of absence has been granted. Unnecessary delay in South Bend is looked upon as a serious violation of rule.

4. Flagrant disobedience to authority, cheating in examinations, the use of intoxicating liquors, immorality, the use of profane and obscene language, and an unauthorized absence from the University limits are among the causes for expulsion. In case of suspension or expulsion for such offences, no fees shall be returned.

5. No branch of study shall be taken up or discontinued without the consent of the Director of Studies.

6. Preparatory students are enrolled in Brownson, Carroll or St. Edward's Hall according to age: boys seventeen years of age or older are placed in Brownson Hall; those over thirteen and under seventeen, in Carroll Hall, and those under thirteen, in St. Edward's Hall.

7. The use of tobacco is forbidden except to such students of Sorin, Corby and Brownson halls as have received from their parents written permission to use tobacco.

8. Continued violation of regulations in Sorin or Corby halls leads to forfeiture of rooms.

9. Although students of all religious denominations are received, the University is nevertheless a strictly Catholic institution, and all students are required to attend divine service in the University Church at stated times.

10. The use of intoxicating liquors is positively prohibited.

11. Undue attention to athletics at the expense of study will not be permitted; but students are expected to take part in outdoor sports.

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12. A limited number of athletic contests is permitted with college organizations from without.

13. All athletic associations of the students are strictly forbidden to countenance anything that savors of professionalism.

14. All athletics are governed by a Faculty Board of Control which will be guided in its rulings by the regulations adopted by the Conference Colleges. The Vice-President of the University and six members of the Faculty will compose this Board, and reserve the right of a final decision on all questions concerning athletics. The Faculty Board will determine the amateur standing of the members of the athletic teams and apportion the finances. By this means indiscreet and unconsidered action of students will be checked.

LECTURES AND CONCERTS

Each winter, eminent men are invited to lecture before the students. Among those who have addressed the University in the past few years may be noted four Apostolic Delegates, Cardinals Satolli and Martinelli, and Monsignors Falconio and Agius; Archbishops Ireland, Riordan, Keane, Glennon and Christie, and Bishops Spalding, Alerding, McQuaid, Muldoon, O'Gorman and Shanley. There were also such noted European churchmen as the Abbé Felix Klein, Monsignor John S. Canon Vaughan and the foremost of living English historians, Dom Gasquet; also men of letters like Dr. D. J. Stafford, Marion Crawford, Maurice Francis Egan, Henry Van Dyke, Seumas MacManus, William Butler Yeats, James Jeffrey Roche, Hamilton Wright Mabie, Opie Read, Leland Powers, Henry James and the Rev. John Talbot Smith; and such men of affairs as Vice-President Fairbanks, Senator Taft, ex-Senator Hill, Senator Beveridge, Attorney General Charles Jerome Bonaparte, Representa-

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tive J. Adam Bede, the Honorable William P. Breen, Representative Bourke Cockran, Dr. James C. Monaghan, Willis M. Moore and the Honorable Edward McDermott. Concerts are given frequently by organizations from without.

During the year 1906-07 the University offered a course of public lectures and concerts in Washington Hall, in addition to the regular and special lectures required by the courses of instruction. The course was as follows:

LECTURES.

OCTOBER	1.	Dr. James C. Monaghan on "Opportunity."
	9.	General N. M. Curtis on "Restoration Days in Virginia in 1865."
NOVEMBER	6.	Judge Ben Lindsey on "Juvenile Courts."
	9.	Professor Frederick Starr on "The Natives in the Congo Free State."
	15.	Edgar J. Banks on (a) "The Arabs and the Arabian Desert."
	16.	(b) "The Excavations and the Bible."
DECEMBER	9.	Mr. S. E. Doane on "Incandescent Lights."
JANUARY	11.	Mr. Clifford H. Easton on "Labrador."
	22.	Dr. Winfield Scott Hall on "The Boys' Problem."
	24.	Dr. Guy Carleton Lee on "Present Conditions and Their Tendencies."
FEBRUARY	14.	Hon. William Jennings Bryan on "Faith."
	26.	Miss Emily Canfield on "Venice."
MARCH	11.	Dr. James C. Monaghan on "Anarchy."
	12.	Mr. Gilbert McClurg on "O Brave New World of Texas."
APRIL	15.	Dr. James C. Monaghan on "American Politics."
MAY	4.	Frank Hamilton Spearman on "The Writing of English."
	4.	Mr. Edmund Privat on "Esperanto."
MAY	8-9.	Four lectures by Dr. V. Lutoslawski, University of Cracow, Poland. (a) Polish Law; (b) Poland; (c) "Plato," (d) "Will Power."
	18.	Dr. Francis J. Quinlan on "Christian Manhood."
	19-25	Five lectures by Dr. John Talbot Smith. (a) "The Making of a Speech;" (b) "Henrik Ibsen;" (c) "The Shattered Idols;" (d) "Modern Drama;" (e) Lytton's "Richelieu."
JUNE	1-3.	John G. Ewing on Socialism.
JUNE	3.	Dr. C. J. Monaghan on "Oratory."
	9.	Russell Wilbur on "Matthew Arnold."
	12.	Russell Wilbur on "Newman."
	13.	His Excellency, Wu Ting Fang, on "Perseverance in Work."

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CONCERTS, READINGS AND DRAMATIC RECITALS

SEPTEMBER	26.	The Reproduction of Parsifal, lecture and pictures.
DECEMBER	6.	Victor's Venetian Band.
	10.	"The Half Back," a play in three acts, by the University Dramatic Club.
JANUARY	12.	"The Rivals," by the Jefferson Company.
	15.	A reading of "Cyrano de Bergerac," by Miss Bertha K. Baker.
APRIL	20.	The Dramatic Club of the University in a presentation of Shakespeare's "Twelfth Night."
MARCH	17.	"Hamnet Shakespeare," a romantic play in three acts by the Philopatrian Society of the University.

STUDENT SOCIETIES

There are several literary or debating societies in the University which do such creditable work at their meetings and in preparation for them that their work takes on the nature of added courses of instruction. In each society a member of the Faculty acts as adviser. In 1907-08 a series of six public debates was held among the members of four Halls — Corby, Brownson, St. Joseph and Holy Cross. An Inter-Hall League has been formed and public debates are held annually. The members of the League also compete every year for a prize in oratory. The College of Law also has an active debating club. The training in public speaking has always received special attention at the University. In fifteen public debates with other universities and colleges Notre Dame has but once met defeat—the decision of the judges in the greater number of these debates being unanimous. In oratory the representative of Notre Dame in the Indiana State Contest for 1906-07 was awarded

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first place, and in the Inter-State contest the judges placed him above the representatives from eleven other States. In 1907-08 the representatives of Notre Dame were given first place in the Indiana Intercollegiate Peace Contest and second place in the Interstate Intercollegiate Peace contest. The University Dramatic Club and the Philopatrian Society stage at least three plays annually for presentation in public. The University Band and the University Orchestra also appear regularly in concerts.

Students of the Department of Civil and Electrical Engineering have each a society in which papers on engineering subjects are read and discussed. Men prominent in their profession are invited to lecture to these societies. The Pharmaceutical Society meets to discuss subjects of interest in the world of pharmacy. In other departments where no such formal organization has been effected similar results are reached by seminars.

NECESSARY EXPENSES.

Matriculation Fee (payable on first entrance).....$ 10.00
BOARD, TUITION, Lodging, Washing, and Mending of Linens, per school year..... 400.00

PAYABLE IN ADVANCE, as follows:

ON ENTRANCE IN SEPTEMBER:

Matriculation Fee (payable first year only).....$ 10.00
First Payment on Board and Tuition..... 250.00
Deposit on Book and Stationery Account..... 10.00
Use of Gymnasium and Natatorium and admission to all intercollegiate games and contests throughout the year. 10.00
Special Lecture, Entertainment and Concert Course..... 3.00

Also, in this First Payment must be included any Extra Expense the student may wish to incur, such as charges for Private Room, Special Courses (listed below).

ON JANUARY 15:

Balance on Board and Tuition.....$150.00
and any extra expenses the student may have incurred.

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No student will be entered for the second term whose account for the first term has not been adjusted.

No rebate will be allowed for time absent at the opening of the Terms, September and January. The charge of $400.00 covers the tuition fee, which is fixed at $100.00 per Scholastic Year. The latter sum is accepted as an entirety for tuition during the Scholastic Year, and will not be refunded in whole or part if the student be dismissed for wilful infraction of the fundamental rules and regulations herein stated and hereby brought to his notice; and so likewise in the event of his leaving and absenting himself from the University at any time or for any cause without proper permission. However, an exception is made if it seems to be expedient for him to go to his home because of severe or protracted illness. *Degrees will not be conferred on any student whose account with the University has not been settled.*

OPTIONAL EXPENSES.

For whole Year of nearly Ten Months, Payable in Advance.

PRIVATE ROOMS—

Seniors, Juniors, and Sophomores Free; Freshmen..$50.00
Preparatory Students.....$60.00 and upwards.

While the students, as a rule, are advised to confine themselves to the regular courses of the programs they have entered, any of the following may be taken at the rate mentioned per Scholastic Year, payable in advance. The charges will be *pro rata* for any portion of the year

Instrumental Music — Lessons on Piano and use of Instrument	$60.00	Lessons on Violin	60.00
Use of Piano for Advanced Students	30.00	*Use of each Instrument	$ 5.00
Telegraphy	25.00	Vocal Culture	75.00
Typewriting—Full Course	20.00	Elocution — Special Course	10.00
One month	5.00	"Scholastic" — College Paper	1.50
Phonography	25.00	Artistic Drawing	35.00
Lessons on Guitar, Flute, Cornet, Clarinet or Mandolin	30.00	Library Fee	5.00
		Physical Culture	5.00

Laboratory fees listed later in this catalogue.

*As the string and band instruments available for rent are few, students taking up these studies are advised to furnish their own instruments.

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GRADUATION FEE.

For all Courses leading to Bachelor Degrees, $10.00; Commercial Course, $5.00.

REMARKS.

The Entrance Fees, cost of Books, Music and Laboratory Fees, etc., are required with first payment.

Remittance should be made by draft, post office money order or express, payable to the order of the President.

Checks on local banks are not desirable, and exchange will be charged in all cases.

Term bills and other accounts are subject to sight draft if not paid within ten days after they have been rendered.

Sorin, Corby, Brownson and Carroll Halls are closed during the months of July and August. Students wishing to spend their Summer Vacation under the care of the University authorities can be accommodated at San Jose Park, Lawton, Michigan.

The charge for the vacation at San Jose Park is $100.00. *Classes (two hours per day) are included in this arrangement. Special tutoring at professors' rates.*

A limited number of student waiters can be received at reduced rates. For conditions of entrance see paragraph entitled St. Joseph's Hall, page 16.

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COLLEGE

OF

ARTS AND LETTERS

DEPARTMENT OF CLASSICS
DEPARTMEMT OF LETTERS
DEPARTMENT OF HISTORY and ECONOMICS

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THE COLLEGE OF ARTS AND LETTERS

From the founding of the University in 1842 to the establishment of the College of Science in 1865, only one program of prescribed courses of instruction leading to a degree was offered to undergraduate students. It embraced studies in the ancient and modern languages, in English literature, in history, the natural sciences and in mathematics. Graduate students might obtain the degree of Master by advanced study one year after obtaining the Bachelor's degree. The group of courses was known as the Program of Classics, and the degrees of Bachelor of Arts and Master of Arts were conferred.

The demand of students for greater freedom of election in courses led the University in 1886 and again in 1898 to form other programs which embraced certain studies not contained in the Program of Classics, but which lead to degrees equivalent to the degree of Bachelor of Arts. In the matter of election of courses the student is permitted greater freedom in the program leading to the degree of Bachelor of Letters than in either of the other groups. The degrees now under charge of the College of Arts and Letters are the ordinary degrees of Bachelor of Arts, Bachelor of Letters, Bachelor of Philosophy and Master of Arts.

The location of the University offers special advantages for study. It is situated on a beautiful tract where cultivation has aided nature, two miles from the noisy bustle of city life. This removal from the distractions of the town gives the students opportunity to pursue their work with the quiet and concentration needed for earnest study. Nearly all the Faculty live on the grounds of the University, dine with the students, and are accessible

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to them at any time. The benefits derived from this constant association with professors can not be overestimated.

Facilities for work are found in the libraries and laboratories. The main library has fifty-five thousand bound volumes well selected and several thousand pamphlets and manuscripts. The leading literary and scientific reviews are kept on file. Books may be borrowed under easy regulations. The library contains ample reading-room space and is well lighted so that students may use it at night. It is open every day from 8 o'clock A. M. to 9:30 P. M. There are also special collections of books in the various departments of the College, mainly works of reference. Under certain conditions the city library of South Bend is open to use by students of the University.

The department of experimental psychology occupies a suite of three rooms on the ground floor of Science Hall. The use of a dark room and a silent room may also be had when need requires. The students have access to the laboratory at all hours of the day and up to ten o'clock at night. The equipment includes apparatus and material sufficient for repeating all the exercises in Sanford's *Manual,* and most of the exercises in Titchener's *Experimental Psychology,* Volume I. The laboratory is supplied with hot and cold water, gas and electricity. At the beginning of the course, the aim is to give students a wide acquaintance with such familiar apparatus as the chronoscope, kymograph, plethysmograph, automatograph, perimeter, campimeter, tone variator, Galton whistle, Galton bar, etc. For the study of special perception, there is a set of stereoscopes, pseudoscopes, and accompanying slides. Provision is also made for the investigation of pressure, temperature, pain, taste, smell, and muscular sensations. Experi-

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ments in the field of auditory perception are facilitated by three sets of organ pipes, a set of Koenig's movable tuning forks and resonators, and various kinds of metronomes. For the study of physiological psychology, a complete set of models of the nervous system is at hand, together with microscopic slides of the various parts of the brain and spinal cord.

ENTRANCE REQUIREMENTS

ENGLISH. Part of the examination time is given for answering questions upon books required to be read in the preparatory courses in English; the remainder, for writing an essay.

LATIN. Grammar, complete; *Caesar,* four books of the Gallic War; *Cicero,* four orations against Catiline; *Vergil, Aeneid,* six books; translations at sight of passages from *Cicero* and *Caesar;* translation of English into Latin based on the text of the authors.

GREEK. (*For Students in the Department of Classics only*) Grammar, etymology and general rules of syntax; *Xenophon, Anabasis,* four books; *Homer,* at least three books; prose composition based on text.

HISTORY. A general knowledge of the outlines of Greek and Roman History and of Medieval and Modern History, as set out in the texts used in high schools and other secondary schools.

CIVIL GOVERNMENT. The Constitution of the United States; Federal Government and State Government.

ALGEBRA. The whole subject as far as logarithms, as given in *Wentworth's College Algebra,* or an equivalent in the larger treatises of other authors.

GEOMETRY. Plane and Solid including the solution of simple original problems and numerical examples as

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given in the works of *Wentworth, Chauvenet, Newcomb,* or an equivalent in treatises by other authors.

PHYSICAL GEOGRAPHY. As given is *Tarr's* text-book or an equivalent treatise.

ZOOLOGY. Elementary.

PHYSIOLOGY. *Martin's Human Body,* or an equivalent text.

BOTANY. Elementary.

CHEMISTRY. Elements of inorganic chemistry. The preparation in this subject must include a course of lectures and recitations, and laboratory work in which at least fifty experiments have been exemplified.

PHYSICS. Elementary. The preparation in this subject should include a course of lectures illustrated by experiments, and recitations from a text-book similar to *Carhart and Chute's* or *Gage's.* Laboratory work is required. Applicants may present either chemistry or physics provided either subject has occupied one whole year with five recitations a week.

FRENCH AND GERMAN. A three years' study of either German or French and one year of French or German is required for entrance on the Program in Letters and the Program in History and Economics. Students who began French in the second preparatory year must have taken up German in the fourth preparatory year and shall continue it for two years in the college course. A like regulation holds for those who began German in the second preparatory year. Applicants for the Program of Classics present a year of French or German.

The entrance examination requires sight translation of ordinary German or French prose: an ability to translate, rather than accurate grammatical knowledge is expected.

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STUDIES PRESCRIBED FOR THE DEGREE OF

BACHELOR OF ARTS

FRESHMAN YEAR

SUBJECTS First Term	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS Second Term	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
Latin	4	146	I	Latin	4	146	II
Greek	4	141	I	Greek	4	141	II
English	3	137	I	English	3	137	I
History	4	144	I	History	4	144	I
Elocution	1	136	III	Elocution	1	136	IV
Elocution	1	137	VIII	Elocution	1	137	VIII

SOPHOMORE YEAR

					4	146	IV
Latin	4	146	III	Latin	4	141	IV
Greek	4	141	III	Greek	4	162	I
Philosophy	4	162	I	Philosophy	3	138	II
English	3	138	II	English	1	137	VIII
Elocution	1	137	VIII	Elocution			

JUNIOR YEAR

Latin	4	147	V	Latin	4	147	VI
Greek	4	142	V	Greek	4	142	VI
Philosophy	4	163	II	Philosophy	4	163	II
English	3	138	III	English	3	138	III
Elocution	1	137	VIII	Elocution	1	137	VIII

SENIOR YEAR

Latin	4	147	VII	Latin	4	148	VIII
Greek	4	143	VII	Greek	4	143	VIII
Philosophy	4	164	III	Philosophy	4	164	III
English	3	139	IV	English	3	139	IV
Elocution	1	136	VI	Elocution	1	137	VII

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STUDIES PRESCRIBED FOR THE DEGREE OF BACHELOR OF LETTERS.

FRESHMAN YEAR

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
English	3	137	I	English	3	137	I
Latin or	4	146	I	Latin or	4	146	II
Elective	5			Elective	5		
French or	5	169	II	French or	5	169	II
German	5	140	II	German	5	140	II
History	4	144	I	History	4	144	I
Elocution	1	136	III	Elocution	1	136	IV
Elocution	1	137	VIII	Elocution	1	137	VIII

SOPHOMORE YEAR

English	3	138	II	English	3	138	II
Philosophy	4	162	I	Philosophy	4	162	I
Latin or	4	146	III	Latin or	4	146	IV
Elective	5			Elective	5		
French or	4	169	III	French or	4	169	III
German	4	140	III	German	4	140	III
History	3	144	II *a*	History	3	144	II *a*
Elocution	1	137	VIII	Elocution	1	137	VIII

JUNIOR YEAR

English	3	138	III	English	3	138	III
Latin or	4	147	V	Latin or	4	147	VI
Elective	5			Elective	5		
Philosophy	4	163	II	Philosophy	4	163	II
History	4	145	III	History	4	145	III
Elocution	1	137	VIII	Elocution	1	137	VIII

SENIOR YEAR

English	3	139	IV	English	3	139	IV
Latin or	4	147	VII	Latin or	4	148	VIII
Elective	5			Elective	5		
Philosophy	4	163	III	Philosophy	4	163	III
Elective	4			Elective	4		
Elocution	1	136	VI	Elocution	1	137	VII

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STUDIES PRESCRIBED FOR THE DEGREE OF BACHELOR OF PHILOSOPHY.

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
FRESHMAN YEAR							
History	4	144	I	History	4	144	I
English	3	137	I	English	3	137	I
French or	5	169	II	French or	5	169	II
German	5	140	II	German	5	140	II
Polit. Science	4	167	I	Polit. Science	4	167	I
Elocution	1	136	III	Elocution	1	136	IV
Elocution	1	137	VIII	Elocution	1	137	VIII
SOPHOMORE YEAR							
History	3	144	II *a*	History	3	144	II *a*
Polit. Science	4	167	II	Polit. Science	4	167	III *a*
Philosophy	4	162	I	Philosophy	4	162	I
English	3	138	II	English	3	138	II
German or	4	140	III	German or	4	140	III
French	4	169	III	French	4	169	III
Elocution	1	137	VIII	Elocution	1	137	VIII
JUNIOR YEAR							
History	4	144	II *b*	History	4	145	IV *a*
Polit. Science	4	167	III *b*	Polit. Science	4	167	IV
Philosophy	4	163	II	Philosophy	4	163	II
History	4	145	III	History	4	145	III
Elocution	1	137	VIII	Elocution	1	137	VIII
SENIOR YEAR							
History	3	145	IV *b*	History	3	145	VI
Political Science	6	167	V, VI VII	Political Science	6	167	VI, VII VII
Philosophy	4	164	III	Philosophy	4	164	III
English	3	138	III	English	3	138	III
Elocution	1	136	VI	Elocution	1	137	VII

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COLLEGE OF SCIENCE

DEPARTMENT OF BIOLOGY

DEPARTMENT OF CHEMISTRY

DEPARTMENT OF PHARMACY

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THE COLLEGE OF SCIENCE

The College of Science was established as a distinct department of the University in 1865. The curriculum of the student was largely elective for the three succeeding years, but in 1867 there was formed the group of prescribed courses now known as the Program of General Science. Five programs are now offered to undergraduate students. The degrees under charge of the Faculty in this college are the ordinary degrees of Bachelor of Science, Bachelor of Science in Biology, Bachelor of Science in Chemistry, Graduate in Pharmacy and Pharmaceutical Chemist. The Master's degree is conferred under the usual conditions.

THE BIOLOGICAL LABORATORIES

The department of Biology occupies the second floor of Science Hall, and consists of four large lecture rooms and laboratories well ventilated and lighted. There are also private laboratories set apart for graduate students. The lecture rooms are furnished with charts and models necessary in teaching the different courses. The arrangement of windows is such that the rooms can be easily darkened so that stereopticon and lantern slides on the subject of botany, zoology and physiology may be used. The laboratories are equipped with compound and dissecting microscopes. In each room there is a library of works of reference pertaining to biological subjects. The general laboratory of microscopy, histology and embryology is supplied with compound microscopes and the equipments indispensable in these courses. The zoological collection fills sixteen large cases and represents typical forms of all the orders and genera of vertebrate and invertebrate animals.

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For work in anatomy, besides a large collection of charts, there are anatomical models of all the parts of the human body, which can be taken apart for close study. Besides there are several mounted and unmounted human skeletons. Students pursuing courses in human anatomy at the University study under a practicing surgeon and have the privilege of attending surgical clinics in the new St. Joseph Hospital of South Bend.

The bacteriological laboratory is completely equipped with compound microscopes, incubators, sterilizers, and all the improved apparatus employed in thorough and careful work in bacteriology. Apart from the others is a laboratory of photo-micography which contains a perfect photo-micographic instrument with a complete set of accessory apparatus for experimentation, photographing microscopic objects, making lantern slides, etc. A large and fully equipped dark room adjoins this laboratory.

THE BOTANICAL LABORATORY

The botanical laboratory occupies the northwest end of Science Hall. It is well lighted and particularly well adapted to microscopical and histological work. The department is supplied with the usual requisites of a working laboratory such as compound microscopes and accompaniments for each student, the utensils and apparatus necessary for embedding by the paraffin, celloiden, soap methods, and mounting of preparations by the balsam, Venetian turpentine and glycerine methods. There are besides, microtomes, camera lucida, micrometers and aquaria for plant cultures so that the typical algae and fungi may be had alive for laboratory use in all stages of development throughout the year. Special devices for the regulating and modifying of artificial light are at hand enabling the student to work on dark as well as clear days. Advanced students are supplied

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with Abbe condenser and oil immersion lenses. The laboratory is well stocked with histological material, and nearly all the types of common plant families of the phanerogamia and cryptogamia are preserved after proper fixing. The material for demonstration of the fresh water algae is particularly good and abundant. The supply of material in Venetian turpentine and glycerine is valuable, as it supplies permanent mounts in a few minutes work. There are also hundreds of specimens of rare and common types in paraffin. A herbarium containing over five thousand species of flowering plants supplies the needs of the classes in systematic botany. The collection includes plants from all parts of the United States and Canada,—the Pacific coast and the Southern States are especially well represented. Besides these there is a large collection of fungi, marine algae, mosses, a large collection of several hundred species of myxomycetes from the Eastern and Central States, also nearly a thousand specimens of lichens from all parts of the United States and Europe. The latter collection is particularly rich in the genus Cladonia. The herbarium is well stocked with the local flora, and special facilities are on hand for the study of the compositae. In the museum are found specimens of American and tropical woods and fruits. The laboratory for more advanced work accommodates about twenty-five students. It is supplied with eight working tables covered with plate glass or soapstone, and each place is supplied with lock and key. The lecture room in botany is on the second floor of the building and has a seating capacity of seventy-five.

THE CHEMICAL LABORATORIES

The Chemical Laboratory building is situated in the southeastern part of the grounds and is a large three-

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story structure devoted entirely to chemistry. On the third floor are a small stock room and the laboratories for general and industrial chemistry, the former capable of accomodating one hundred and fifty students, the other seventy. The desks are all supplied with gas, water, suction and the necessary reagents. On the side tables are general stock and general apparatus, and conveniently placed are small stands for suction and blast lamps supplied with gas, air blast, acetylene. On the third floor also is the large fan used for drawing gases from the hoods, with which all the laboratories are supplied. On the middle floor are the main stock rooms where supplies can be obtained by the students. Here also are the laboratories, lecture-room, drug store, library and museum of the Department of Pharmacy. On the first floor are the laboratories for qualitative and quantitative analysis with desks to accommodate sixty-five students, and fitted with gas, suction, water and blast. Large hood accommodations are available and can be utilized to advantage because of the perfect ventilation produced by the large fans on the top floor. Two small side tables are equipped with air blast, ordinary gas and acetylene. To the east of these laboratories are those for physical and electrochemistry and special work such as food analysis, iron and steel analysis, gas analysis, etc. The equipment in these laboratories is quite complete. Adjoining these laboratories is a small dark room for spectroscopic and polariscopic analysis. A large lecture room to accommodate a hundred and ten students is in the south end of the first floor. It is provided with apparatus for steropticon illustrations, storage batteries, cylinders of oxygen, hydrogen, carbon dioxide and a complete set of charts illustrative of the processes employed in modern chemical industries. Two

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laboratories adjoin, one for general organic analysis, the other for special advanced work. Two wings extend from the main building,—one contains the vacuum and pressure tanks, the acetylene and gasoline gas generators, the other the balance rooms, in which are the analytical and assay balances sensitive to the one ten-thousandth of a gramme, and the library of the Department. The library contains besides the works of reference on chemistry, the principal chemical journals on file—*Berichte, Zentralblatt,* the *Chemical News,* the *Journal of the American Chemical Society,* the *Journal of the British Chemical Society,* the *Journal of Chemical Engineering,* the *Journal of Chemical Industries,* etc. In the large hallway are cases containing a steadily increasing collection of minerals, chemicals, and chemico-technical products of various kinds, designed as illustrations of the substances and processes discussed in the lectures.

The assaying and mineralogical laboratories are in a wing of Science Hall. They contain both gas and fuel furnaces for assaying gold, silver and lead ores, and also tables for blow-pipe analysis. A large collection of minerals and ores serves to illustrate the processes.

THE PHYSICAL LABORATORIES

The department of physics occupies a suite of three rooms in the south end of the first floor of Science Hall and three laboratories in the basement. The lecture room will accommodate seventy-five students. For the work in mechanics there is the force table, inclined planes, Geneva cathetometer, capable of measuring to one twenty-five thousandth of an inch, a large physical balance, standard kilogram, a standard metre, a dividing engine made by the Geneva society, an Atwood's machine, a compound pendulum, a break circuit recording chronograph, a powerful hydraulic press with attachments, ro-

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tary air pumps and receivers, a large clock with electrical contact pieces, several self-winding clocks, mercury barometers and two aneroid barometers.

For the work in acoustics there are a Mercadier radiophone, a set of Koenig resonators, a set of electrically-operated tuning forks by Koenig, a Scott-Koenig phonautograph, an Edison phonograph of earliest type, several sets of vibrating rods, tubes and bells, a large double siren, a set of very small tuning forks producing the highest audible sounds, a set of resonators mounted together with capsules for sensitive flames arranged for the analysis of complex sounds, a set of Koenig's movable tuning forks to draw compound curves on smoked glass, three sets of organ pipes, four sets of fine tuning forks, a set of apparatus for manometric observation of sound phenomena, a large tuning fork producing the lowest audible sound, an electrical metronome, a set of mounted tuning forks carrying small mirrors arranged to perform Lissajou's experiment, producing complex curves.

For the work in light there are a complete set of apparatus by Soleil, Paris, for the measurement of the wave lengths of light by various interference methods, a set of polarization apparatus, sets of lenses and spherical mirrors, two heliostats, four spectroscopes, a polarizing saccharimeter, three projecting lanterns for gas or electric light and 3,000 slides, a set of large Nicol's prisms mounted, a large compound prism to form widely dispersed spectrum, two Rowland gratings 14,000 lines to the inch, a set of photographs of solar spectrum by Rowland, several cameras with lenses and attachments, a well-equipped dark-room for photographic work, and a photometric room and equipment.

For work in heat there are Melloni's apparatus for measuring radiation, absorption and reflection of heat

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complete with a set of prepared substances, standard thermometers, air thermometers, a steam engine indicator, several calorimeters, apparatus for determining the coefficient of linear expansion using the optical lever method.

For work in electricity and magnetism there are an absolute electrometer, a Holtz machine and apparatus for illustrating static phenomena, four induction coils, six bridges of different types, several anmeters and voltmeters, one 2,000 lb. electro magnet, standard resistance coils, a historical set of motors showing evolution of the modern machine from the early forms of the reciprocating type, ten galvanometers of various types, a complete X-ray utfit, sets of apparatus for wireless telegraphy.

REQUIREMENTS FOR ADMISSION

Candidates for the Freshman class of the four-year programs must be prepared to pass an examination in the branches named below unless satisfactory assurance of proficiency is given by approved certificate.

PHYSICAL GEOGRAPHY. As given in *Tarr's* text-book or an equivalent treatise.

PHYSIOLOGY. *Martin's Human Body,* or an equivalent treatise.

ZOOLOGY. Elementary.

BOTANY. Elementary.

CIVIL GOVERNMENT. The American Constitution; Federal and State Governments.

HISTORY. General outlines of Ancient, Medieval and Modern History.

ALGEBRA. The whole subject as far as logarithms, as given in *Wentworth's College Algebra,* or an equivalent in the larger treatises of other authors.

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GEOMETRY. Plane and solid, including the solution of simple original problems and numerical examples, as given in the works of *Wentworth, Chauvenet, Newcomb,* or equivalent treatises by other authors.

TRIGONOMETRY. Plane and spherical.

CHEMISTRY. Elements o f inorganic chemistry. The preparation in this subject must include a course of lectures and recitations. A course of at least fifty experiments in elementary chemistry actually performed by the pupil.

PHYSICS. Elementary. The preparation on this subject should include a course of lectures, illustrated by experiments, and recitations from a text-book similar to *Carhart and Chute's* or *Gage's.* Laboratory work is required.

ENGLISH. Part of the examination is given for answering questions upon books required to be read in the preparatory courses in English in the Preparatory School of the University; the remainder for writing an essay.

GERMAN. A two-year course in German is required. Ability to translate at sight easy German into English, and easy English into German, or

FRENCH. A two-year course in French may be presented instead of German under the same conditions. Ability to translate readily, rather than an accurate grammatical knowledge, is expected.

LATIN. Grammar, complete; *Caesar,* four books of the Gallic War; translation of English into Latin based on the text of *Caesar.*

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PROGRAM OF GENERAL SCIENCE

The Program in General Science is calculated to afford such an acquaintance with the methods and facts of modern science as will best enable the student to fit himself, tither for further study of a technical or professional kind, or for the activities of business life. The natural and physical sciences constitute the primary studies of this program. Grouped about these are such studies in English, mathematics, and modern languages, as experience has shown to be necessary for the intelligent pursuit of science and the attainment of the object of the program.

Two essays on scientific topics are required of every student in the Sophomore year and two in the Junior year.

The scientific work of the Senior year is elective. Advanced courses may be chosen in physics, chemistry, biology and mathematics.

Every candidate for a degree in the Program of General Science is required to submit, before the final examination, a written thesis upon some subject connected with the elective work of the Senior year. The subject chosen must have the approval of the professor in the course selected. The thesis shall contain no less than five thousand words, and must be satisfactorily in matter and treatment.

Students who complete the required courses, pass the final examination and present a satisfactory thesis will receive the degree of Bachelor of Science.

In the schedule an hour means two sixty minute periods of laboratory work or one of lecture or recitation.

LABORATORY FEES

Chemistry I., VII., each.....$ 5.00
Chemistry II., III., IV., V., VI., VIII., IX., XI., XIII., each 10.00
Physics III., Zoology I., Botany II., Geology I., each..... 5.00

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STUDIES PRESCRIBED FOR THE DEGREE OF BACHELOR OF SCIENCE.

SUBJECTS FIRST TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course	SUBJECTS SECOND TERM	Hrs. a Week	SEE FOR DESCRIPTION Page	Course
FRESHMAN YEAR							
Zoology	5	172	I	Zoology	6	172	I
Chemistry	4	115	III	Chemistry	4	115	III
Algebra	5	148	I	An. Geometry	5	149	II
Drawing	2	131	I	Drawing	1	131	II
Physiology	4	166	I	Physiology	4	166	I
SOPHOMORE YEAR							
Botany	5	112	I, II	Botany	5	112	I, II
Chemistry	4	115	IV	Physics	5	165	II, III
Physics	5	165	II, III	Calculus	5	150	IV, V
Calculus	5	149	III	Elective	5		
JUNIOR YEAR							
Geology	2	139	I	Geology	4	140	III
Elective	5			Astronomy	3	111	I
English	3	137	I	English	3	137	I
French or	5	169	I	French or	5	169	I
German	5	140	I	German	5	140	I
Philosophy	4	162	I	Philosophy	4	162	I
SENIOR YEAR							
Philosophy	4	163	II	Philosophy	4	163	II
Three Electives in Science	9, 11			Three Electives in Science	9, 11		
French or	5	169	II	French or	5	169	II
German	5	140	II	German	5	140	II

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THE PROGRAM IN CHEMISTRY

This program is intended for students who wish to obtain such a knowledge of chemistry as may fit them for professional work either in the laboratory or the classroom. Though fixed to a great extent, the schedule of work admits in the Junior and Senior year of some elective study.

Every candidate for a degree in Chemistry is required to write an essay in the Junior year on some subject connected with Chemistry and must submit, at least four weeks before the final examination, a written thesis on work covered in his Senior year. This thesis must contain at least three thousand words.

The degree of Bachelor of Science in Chemistry is given to those students who have written an approved thesis and have passed a satisfactory examination.

In the schedule, an "hour" means two sixty minute periods of laboratory work or one of lecture or recitation.

LABORATORY FEES

Chemistry I., VII., each	$ 5.00
Chemistry II., III., IV., V., VI., VIII., IX., XI., XIII., each	10.00
Physics III.	5.00
Geology I.	5.00

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STUDIES PRESCRIBED FOR THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY

FRESHMAN YEAR

SUBJECTS First Term	Hrs. a Week	See for Description Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description Page	Course
Chemistry	4	115	III	Chemistry	4	115	III
Algebra	5	148	I	Anal.Geom.	5	149	II
French	5	169	I	French	5	169	I
Physics	5	165	II, III	Physics	5	165	II, III

SOPHOMORE YEAR

Chemistry	4	115	IV	Chemistry	4	116	V
Calculus	5	149	III	Calculus	5	150	IV, V
Geology	2	139	I	Geology	4	140	III
Chemistry	5	116	VI	Chemistry	6	117	IX
Gas Analysis	4	117	VIII				

JUNIOR YEAR

Chemistry	7	117	IX	Chemistry	4	118	XI
Chemistry Elective	5			Chemistry	3	118	XIII
Elective	5			Chemistry Elective	5		
English	3	137	I	Assaying	2	140	II
				English	3	137	I

SENIOR YEAR

Philosophy	4	163	II	Philosophy	4	163	II
History of Chemistry	3	118	XII	Chemistry Elective	5		
Elective	5			Scientific Readings in German and French	2		
Scientific Readings in German and French	2			Thesis	2		

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PROGRAM IN BIOLOGY

The Program in Biology has been designed for students who wish to devote their time largely to biological pursuits, either as an immediate preparation for the study of medicine or veterinary science, or with a view to teaching or otherwise engaging in biological research. The students in this program are required to prepare an essay during the first term of the Junior Year on some subject pertaining to biology. Every candidate for a degree must submit before the final examinations a written thesis accompanied with original drawings. Students not preparing themselves for the medical profession may substitute for the advanced courses in anatomy and physiology equivalents from either mathematics, physics, or English literature.

LABORATORY FEES

Biological Laboratory—*Zoology I., II., each*	$ 5.00
Botanical Laboratory—*Botany II., IV., each*	5.00
Microscopy—*for Courses I., II*	1.00
Bacteriological Laboratory—*Bacteriology*	10.00
Physics III.	5.00
Chemistry III., IV., V., VI., each	10.00

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STUDIES PRESCRIBED FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGY

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
FRESHMAN YEAR							
Zoology	5	172	I	Zoology	6	172	I
Chemistry	4	115	III	Chemistry	4	115	III
Microscopy	2	156	I	English	3	137	I
English	3	137	I	French	5	169	I
French	5	169	I	Drawing	1	133	IX
Drawing	1	133	IX				
SOPHOMORE YEAR							
Physiology	4	166	I	Physiology	4	166	I
Botany	5	112	I, II	Botany	5	112	I, II
Chemistry	4	115	IV	Chemistry	4	116	V
Physics	5	165	II, III	Physics	5	165	II, III
Drawing	1	133	X	Drawing	1	133	X
JUNIOR YEAR							
Anatomy	3	106	III	Anatomy	3	106	III
Botany	6	113	III, IV	Botany	4	113	III, IV
Geology	2	139	I	Geology	4	140	III
Philosophy	4	162	I	Philosophy	4	162	I
Bacteriology	3	111	I	Chemistry	5	116	VI
SENIOR YEAR							
Anatomy	2	106	II	Anatomy	2	106	II
Anatomy	3	106	III	Anatomy	3	106	III
Physiology	6	166	II	Physiology	6	166	II
Zoology	6	172	II	Zoology	6	172	II
Thesis				Thesis			

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PROGRAMS IN PHARMACY

There are two programs in Pharmacy: one of two years, leading to the degree *Graduate in Pharmacy, (Ph. G.)*; and another of three years leading to the degree, *Pharmaceutical Chemist, (Ph. C.)*

ADMISSION

Applicants for admission to the short program must be 18 years of age, and must pass an examination in the subjects required for the first year of high school work. A certificate of work done equivalent to one year of high school will be accepted instead of an examination.

The requirements for the long programme are the same, except that an examination in Latin through Caesar and Algebra as far as logarithms must be passed. Satisfactory evidence of having spent two years in a high school of the best grade will be accepted instead of an examination.

METHODS

The subjects studied in this department are intended to impart a thorough theoretical as well a practical knowledge of Pharmacy, the work commencing with the simplest and gradually leading up to the most difficult and complicated process.

Special attention is given to the little details, which are essential to success, in any professional work and particularly so in Pharmacy. The student is carefully drilled in store etiquette, business hints, prescription work, and dispensing. Neatness and order in all the operations and extreme care in the manufacture of preparations are required throughout the courses.

Attention is given to Animal extracts, Serum-Therapy, Antitoxins, new Synthetic Remedies and Alkaloidal Medication.

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EQUIPMENT

Each desk is supplied with all the apparatus necessary for ordinary work. Special apparatus is furnished as required.

The department contains a fully equipped Drug Store in which the student obtains practically the same experience that he would get in actual business. A second year student is placed in full charge. He is required to furnish supplies for the department, order material, write business letters, invoice stock, etc. Then at the end of a specified time he delivers the store in good order to his successor.

About 2,000 recent prescriptions written by physicians, and taken from the files of a drug store, constitute a very important part of the equipment. Under supervision of the instructor each student is required to read them and to compound those requiring special manipulation. The reading rooms is supplied with all the leading pharmaceutical journals and books of reference. The Pharmacognosy room contains specimens of all the official and a great many unofficial drugs for study and identification.

THESIS

During the third year the student is required to spend at least two hours a week in original research on a subject within the domain of Pharmacy. The results of this work are carefully recorded and must be typewritten and presented to the Faculty as a requirement for graduation.

Pharmaceutical Laboratory II., and IV., each	$20.00
Pharmaceutical Laboratory VI. and VII., each	20.00
Chemistry I., and VII., each	5.00
Chemistry IV., V. and Vi., each	10.00
Physics	5.00
Microscopy	1.00
Mineralogy	5.00

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PROGRAMS IN DEPARTMENT OF PHARMACY

Degree: Ph. G.

FIRST YEAR

SUBJECTS First Term	Hrs. a Week	See for description Page	Course	SUBJECTS Second Term	Hrs. a Week	See for description Page	Course
Pharmacy	3	160	I	Pharmacy	6	160	I, II
Chemistry	5	114	I	Chemistry	5	114	I
Microscopy	2	156	I	Chemistry	2	117	X
Botany	5	112	I, II	Botany	5	112	I, II
Arithmetic	3	162	IX	Mat'ra Medica	2	162	VIII

SECOND YEAR

Pharmacy	8	161	III, IV	Pharmacy	8	161	V, VI
Chemistry	4	115	IV	Chemistry	4	116	V
Mat'ra Medica	3	161	VIII	Mat'ra Medica	3	161	VIII
Bacteriology	3	111	I	Pharmacog'y	3	162	X
Physics	5	164	I	Physics	5	164	I
				Physiology	4	166	I

Degree: Ph. C.

FIRST YEAR

Pharmacy	3	160	I	Pharmacy	6	160	I, II
Chemistry	5	114	I	Chemistry	5	114	I
Microscopy	2	156	I	Chemistry	2	161	X
Botany	5	112	I, II	Botany	5	112	I, II
Arithmetic	3	162	IX	Mat'ra Medica	2	162	VIII

SECOND YEAR

Pharmacy	8	161	III, IV	Pharmacy	8	161	V, VI
Chemistry	4	115	IV	Chemistry	4	116	V
Mat'ra Medica	3	161	VIII	Mat'ra Medica	3	161	VIII
Bacteriology	3	111	I	Pharmacog'y	3	162	X
Physics	5	164	I	Physics	5	164	I
				Physiology	4	166	I

Pharmacy	5	161	VI	Pharmacy	5	161	VII
Chemistry	5	116	VI	Chemistry	5	119	XIV
Mineralogy	2	139	I	Urinary Anal.	3	116	VII (a)
Thesis	2			Toxicology	3	116	VII (b)
Elective	5			Thesis	2		
				Elective	5		

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COLLEGE OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

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THE COLLEGE OF ENGINEERING

In the industrial development of a country the engineer takes an important part. Many new industries are springing up and the great activity in those already established throughout the world creates a demand for the services of trained engineers.

The programs of studies in the three departments of engineering at Notre Dame are arranged to give a knowledge of the fundamental facts and theories that are applied in engineering work. Mathematics is foremost among these requirements. The natural sciences receive their share of attention and due importance is given to languages in arranging the programs of studies.

Laboratory work and field work give a certain amount of practice in the application of the theory to actual physical conditions. These conditions are made to correspond as closely as possible to the real work of the engineer.

A student who has no liking for mathematics should not be encouraged to take up an engineering course. The successful engineer is one who thinks clearly and acts accurately. Clear thinking is necessary to master mathematical subjects and skill and accuracy are acquired by applying the results of mathematical calculations to particular practical cases in laboratory work.

Three regular programs of studies have been arranged: one leading to the degree of Civil Engineer, one to the degree of Mechanical Engineer, and one to the degree of Mechanical Engineer in Electrical Engineering.

Special Short Courses in Electrical and Mechanical Engineering are offered to accommodate those who wish

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to fit themselves for practical work in the shortest possible time.

The various laboratories are equipped with the most approved forms of instruments and appliances and considerable time is given to technical work. The equipment for each department will be found described and referred to on the succeeding pages of this catalogue.

In addition to the work in the laboratories and the power plants of the University, students are taken on inspection tours to the important engineering works in the neighborhood. Several of the largest manufacturing plants in the world are in South Bend or the vicinity.

In the schedules of studies one hour of credit is given for each recitation or lecture which requires from one to two hours' preparation. Two hours actual time in laboratory work, shopwork or drawing are required for each hour on the schedule.

EXPENSES

In addition to the regular fee for matriculation, board, tuition, lodging, etc., as given on page 33, the regular students in the three Engineering Programs are required to pay laboratory fees to cover, in part, the cost of materials consumed and the deterioration of the apparatus used, as follows:

LABORATORY FEES

Physical Laboratory I., and III., each	$ 5.00
Physical Laboratory IV	15.00
Electrical Laboratory I., II	15.00
Electrical Laboratory IV	15.00
Shopwork, all four-year programs, per term	15.00
Chemistry I.	5.00
Chemistry II., IV., V., each	10.00

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REQUIREMENTS FOR ADMISSION

ALGEBRA. The whole subject as far as logarithms, as given in *Wentworth's College Algebra,* or an equivalent in the larger treatises of other authors.

GEOMETRY. Plane and solid, including the solution of simple original problems and numerical examples, as given in the works of *Wentworth, Chauvenet, Newcomb,* or an equivalent in treatises by other authors.

TRIGONOMETRY. Plane and spherical.

CIVICS. The Constitution of the United States; Federal Government and State Government.

HISTORY. General outlines of ancient, medieval and modern history.

GEOGRAPHY. Physical, as much as is contained in *Tarr's* text-book or an equivalent treatise.

PHYSICS. Elementary. The preparation on this subject should include a course of lectures, illustrated by experiments and recitations from a text-book like *Carhart and Chute's* or *Gage's.* Laboratory work is also required.

CHEMISTRY. The elements of Chemistry. Laboratory work required.

BOTANY, PHYSIOLOGY AND ZOOLOGY. Elementary.

MODERN LANGUAGE. Engineering students must present a three years' course in German.

ENGLISH. Part of the examination time is given for answering questions upon books required to be read in the preparatory courses in English; the remainder for writing an essay.

If the applicant passes these examinations satisfactorily he may begin at once the regular Freshman work; but if he is deficient in any one or more subjects he may enter conditionally and make up his deficiency as soon as possible in the Preparatory School of the University.

Credits from high schools or preparatory schools in good standing will be accepted in place of examinations.

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THE DEPARTMENT OF CIVIL ENGINEERING

The courses of instruction are designed to prepare students for a thorough and systematic training in the sciences and in the principles of Civil Engineering, to perform intelligently the duties of their profession either in the office or in some of the responsible positions superintending the construction and operation of public works. To secure these results the student is given, not only a sound theoretical training in the courses of study, but he is also required to study the practical applications of the principles upon which the theory is based. The first two years are devoted to the study of mathematics and the theoretical branches. The last two years are given to the study of applied courses—practical work in the laboratory and field, as much as possible, being required throughout the course.

Sufficient instruction is given in French and German to enable the student to read easily and intelligently professional works in these languages; and the study of English is pursued until the student is qualified to prepare acceptable themes on professional subjects. Instruction based upon standard text-books on engineering is given throughout the course by means of lectures, recitations, practice in laboratory, drawing-room and field. This work is largely supplemented by assigning to the student, for solution, practical problems bearing directly upon the subject matter discussed in the class room and requiring original investigation, thus training the student to habits of independence and awakening his interest in the work of his profession.

The Department is provided with all the instruments necessary for effective work in the different branches of

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field engineering. The instrumental outfit consists of surveyors' transits, engineers' transits with levels and vertical circles attached to telescopes, also solar attachments, engineers' wye levels and a plane table with all the attachments, clinometers, chains, tapes, levelling rods, etc., and one Olson's cement testing machine. After the student is taught the use and adjustment of the instruments, surveys, elementary in character, are commenced and continued progressively until the more difficult principles and methods are understood. In a similar manner is instruction given in the courses of sanitary engineering, hydromechanics, resistance of materials, bridges and roofs, etc., thus familiarizing the student with practical engineering subjects, and the most improved method of execution and designing. A large draughting room offers "facilities for the proper study of all the courses in mechanical drawing and design. The room is splendidly lighted from above, well ventilated and contains the latest form of drawing tables. There are suitable arrangements for blueprinting, both by natural and electric light.

The constantly growing city of South Bend, with a population now of sixty thousand, is one of the most important manufacturing cities in the Middle West. Some of the largest plants in the world are situated here. One of the greatest water power developments in the United States is located a few miles from the University. Special advantages are thus afforded to students for the inspection of the most modern engineering works now completed or in process of construction. The City Engineer is one of the examing board.

A thesis on some subject approved by the head of the Department connected with the course of study, is required of each student as a condition of graduation. The thesis must embody the results of original research.

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STUDIES PRESCRIBED FOR THE DEGREE OF CIVIL ENGINEER.

FRESHMAN YEAR

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
Algebra	5	148	I	Anal. Geom.	5	149	II
English	3	137	I	French	5	169	I
French	5	169	I	Chemistry	4	114	II
Chemistry	4	114	II	Drawing	2	131	II
Drawing	3	131	I, II	Surveying	3	131	I

SOPHOMORE YEAR

Calculus	5	149	III	Calculus	5	150	IV, V
Des. Geometry	3	120	I	Des. Geometry	3	120	I
R. R. Surveying	5	122	VI, VII	Adv. Survey'g	5	121	IV, V
Physics	5	165	II, III	Physics	5	165	II, III
Drawing	1	131	V	Drawing	1	131	V

JUNIOR YEAR

Analytic Mechanics	5	122	VIII	An. Mechanics	2	122	VIII
Geodesy	4	123	IX	Mechanics of Materials	3	123	X
English	3	138	II	Astronomy	3	111	I
Geology	2	139	I	English	3	138	II
Stereotomy	3	132	VI	Geology	4	140	III
				Drawing	3	132	VII

SENIOR YEAR

Engineering	5	125	XII	Engineering	5	125	XII
Hydromechan	3	127	XVI	Hydromechan	3	127	XVI
Bridges, Roofs	5	126	XIV	Graph. Stat.	5	126	XV
Sanitary Eng.	2	125	XIII	Sanitary Eng.	2	125	XIII
Drawing	3	132	VII	Roads, Pav'mt	4	124	XI
				Thesis			

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THE DEPARTMENT OF MECHANICAL ENGINEERING

The program of studies in Mechanical Engineering, leading to the degree of Mechanical Engineer, is open to young men who wish to prepare themselves for the designing of machinery, with its appurtenances, and for the successful management of power plants. As the program requires a thorough knowledge of pure and applied Mathematics, as well as of Physics, only those capable of adapting themselves to these requirements should take it up. The program of the department is modeled in the twofold belief that a thorough fundamental training is best secured by a study of the practical application of the principles involved, as well as of the theoretical principles.

The work of the department, conducted in connection with other departments elsewhere described, consists of the study, by text-book or lectures, of the materials used in mechanical engineering, accompanied by the science of pure mechanical kinematics, which traces the motions of connected parts without reference to the cause of such motions, to the work done or energy transmitted. This is succeeded by machine design, which is a direct development of kinematics, and the course continues throughout the Junior and Senior years.

The courses in Shopwork are most complete. The first year's work is confined to practice in the woodshop, in which the principles of carpentry, turning, and pattern-making are taught. When the students have become sufficiently skilled in woodwork, they take up the work of the foundry, blacksmith shop, and machine shop. A systematic course of training is provided, which advances

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the student by easy steps until he has mastered all the details of the work.

The latter part of the Senior year is largely taken up in the preparation of a graduation thesis. Here especially the student is taught to depend as much as possible upon his own resources and abilities in exercising his ingenuity. This is the culmination effort of the program, embodying its chief results, and is expected to show considerable originality.

Every possible advantage is given the student wishing to specialize in some of the branches of engineering, toward furthering his knowledge and ability in the particular field desired. He may take up general machine design, steam engine design, specifications and contracts, installation and erecting, original research or gas engine design and operation. A systematic curriculum of study will be outlined in each individual case leading to a complete and proficient knowledge of the work undertaken.

Access may be had to all machinery and apparatus of the University contained in the various power plants and laboratories elsewhere described, and every effort is made by the authorities to make the work as comprehensive as possible.

The laboratories and shops are equipped with all necessary apparatus and machinery. The wood shop is supplied with modern work-benches fully equipped with the smaller tools necessary for carpentry, lathes for turned work, two jig saws, a pony planer, a joiner, an edge moulder and sharper, a universal trimmer, circular saw with dado and drilling attachments and band saw, the whole forming an adequate equipment for a thorough mastery of joinery, scroll work and pattern making.

The power for operating the machine shop is derived from the electric plant of the University, two ten-horse

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power motors being used for this purpose, from which power is transmitted to the various machines by line shafting running the entire length of the building. The latest improved lathes have been provided, nine in number, varying from a five-inch swing in the smallest to a large engine lathe with sixteen foot bed having a capacity for work twenty-eight inches in diameter. Two drill presses, a large planer, a shaping machine and a Brown and Sharp milling machine complete the outfit, thus making the machine shop a model of its kind. There have been completed lately in the machine shop seven new screw cutting lathes of fourteen inch swing, a high speed bench hand lathe, one twenty-eight inch Sibley and Ware drill press, one horizontal 8 x 12 slide valve steam engine and a wood milling machine. The equipment is added to regularly, and recently a Seneca Falls lathe of fourteen inch swing and eight foot bed, a Crown high speed lathe, a Toledo punch press and a complete new set of chucks, drills, taps, mandrels and lathe dogs have been installed to meet the additional requirements of the courses. It is the policy of this department to refrain as much as possible from exercise work, and each student is usually taking part in the construction of some new machine or engaged on general repair work for the University, a plan which is regarded superior to a fixed routine of exercises.

The blacksmith shop has the usual complement for teaching forging, annealing, welding and tool making. In the foundry work the student is instructed in the proper disposition of gates and sprues, the mixing of sand, setting up and drawing simple and complicated patterns and core making. This is supplemented with lectures on the proper mixing and heating of cast iron for the various purposes for which it is used.

In addition to the facilities afforded by the shops, the

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engineering students have access to the steam and power plants of the University which have been recently remodeled and made to compare favorably with the best contemporary practice. The main steam plant contains two batteries of ten horizontal tubular boilers, aggregating 1200 horse power. In connection with the boilers is installed the necessary testing apparatus as follows: a Worthington hot water meter for measuring the amount of feed water, a feed water thermometer for getting temperature of same, a high range thermometer for temperature of generated steam, a throttling calorimeter for ascertaining the quality of steam and an automatic recording pressure gauge giving a continuous record of the boiler pressure. Provision is made for finding the temperature and pressure of the flue gases by means of a pyrometer and draught gauge and for obtaining samples of flue gas for analysis with Fisher's analysis apparatus. These, with a Carpenter coal calorimeter for determining the heating value of fuel, comprise a full and complete equipment for giving the student an intimate knowledge of the practical part of boiler management and testing. A Webster feed water and purifier, two compound duplex pumps, two vacuum pumps working on the heating system, two large Worthington fire pumps 16 by 9 by 12 with a capacity of 1,500 gallons per minute, with numerous separators, steam traps, automatic reducing valves, etc., complete the apparatus in the main steam plant. A McEwen high speed automatic engine, an Armington and Sims engine of similar type and several low speed horizontal engines with polar and roller planimeters, indicators, reducing wheels, slide rules and other necessary instruments, are used in studying the operation of the steam engine, distribution and economy of steam, regulation, valve setting and heat wastes.

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There have been donated in the past year to the mechanical laboratory about four hundred brass and iron fittings, used in steam and gas engineering, including feed water injectors, sight feed lubricators, oil cups, safety valves, relief valves, different varieties of globe valves, gate valves, tees, elbows, crosses, unions, bushings and reducers. Many of these have been sectioned to show the dimensions, and facilitate a study of the internal structure and arrangement of parts.

In the gas engine laboratory are installed one horizontal eleven horse power four cycle gas engine completely equipped for experimental runs, with indicator reducing motion, prony brake, scales and thermometers, a five horse power two cycle vertical gas engine of the marine type, a four horse power horizontal four cycle gasoline engine with circulating pump and cooling tower, one Motsinger auto-sparker with induction coil, one Apple ignition dynamo with storage battery, two Hendricks automatic igniters together with carburettors, spark plugs, spark coils, indicators, and all necessary equipment for a complete study of the gas engine.

Recent additions include the latest type Kingston carburettor and muffler, a National storage battery, Pittsfield induction coils and dash coils, two Wizard magnetos with brass armored spark coils, one four engine cylinder distributor and a number of improved standard and meter spark plugs.

A set of castings for an eight horse power engine to be operated by alcohol has been placed in the machine shop, and the work of designing and building the engine will be undertaken by the students.

In the department library, standard authors may be consulted and the current literature on engineering topics is kept on file for reference, as well as a complete line of trade catalogues.

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STUDIES PRESCRIBED FOR THE DEGREE OF MECHANICAL ENGINEER

FRESHMAN YEAR

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
Algebra	5	148	I	Analyt. Geom.	5	149	II
French	5	169	I	French	5	169	I
Drawing	3	131	I	Drawing	3	131	II
Chemistry	4	114	II	Chemistry	4	114	II
Shopwork	3	155	XIV*a*	Shopwork	3	155	XIV*b*

SOPHOMORE YEAR

Calculus	5	149	III	Calculus	5	150	IV, V
Drawing	3	132	VIII	Drawing	3	132	VIII
Chemistry	4	115	IV	Chemistry	4	116	V
Physics	5	165	II, III	Physics	5	165	II, III
Shopwork	3	156	XIV*c*	Shopwork	3	156	XIV*d*

JUNIOR YEAR

An. Mechanics	5	122	VIII	An. Mechanics	2	122	VIII
Kinematics	5	153	V	Mech's of Mat's	3	123	X
English	3	137	I	Mach'n Design	3	153	VI
Physics	3	165	IV	Physics	3	165	IV
Shopwork	3	156	XIV*e*	Valve Gears	2	153	VII
				English	3	137	I
				Shopwork	3	156	XIV*f*

SENIOR YEAR

Materials of Engineering	2	151	II	Steam-Engine Design	5	152	III
Thermod'nam	5	151	I	Steam Boilers	3	152	IV
Steam Engine Design	5	152	III	Thermod'nam	5	151	I
Mechan'l Lab.	3	154	VIII	Thesis			
Shopwork	3	156	XIV*f*				

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TWO-YEAR PROGRAM IN MECHANICAL ENGINEERING

Theory, Design and Operation of Gas, Oil, and Vapor Engines.

This program is devoted exclusively to the study of explosive motors, and embraces it in theory, design, construction and operation.

The rapid progress made in recent years in the design of gas engines, together with their adaption to the supplying of power for almost every requirement, has led to the establishment of this program for young men wishing to make a special study of this branch of engineering.

The essential work of the first year consists of a general descriptive study of the different types of engines with discussions on the general management, operation, care and special uses to which this type of motor may be applied. During the second year the general theory of the gas engine is studied and the design of an engine for a specific purpose is undertaken by each student.

The laboratory work will consist in part of indicator practice, determination of mechanical and thermodynamic efficiency, speed regulation, and economy. Experiments in flame, electric and hot tube ignition, operation of vaporizers and curburetters, construction of spark coils with management and care of motors will complete the work.

The courses in shopwork are intended to give practical application to the theories advanced in the class room by the complete building and testing of a gas engine of a design to be selected by the demonstrator. Each student is required to prepare the patterns and core-boxes, machine the castings and forgings, assemble the complete

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engine and submit a comprehensive report of a test on the machine constructed. If the report proves satisfactory a certificate of proficiency is given to the student and the gas engine becomes his own property.

For admission to this program the student must have completed courses XIVa and XIVb in shop work and must certify by examination or certificate evidence of a knowledge of Algebra as far as logarithms and his further ability to pursue the studies of the first year. Candidates shall also write a short essay, which must be satisfactory in spelling, punctuation, sentence and paragraph construction.

The equipment and facilities for the courses will be found described on pages 69-72.

STUDIES PRESCRIBED FOR SHORT PROGRAM IN MECHANICAL ENGINEERING

FIRST YEAR.

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Week a Hrs.	See for Description: Page	Course
Geometry	5	190	E	Trigonometry	5	191	H
Drawing	2	131	I	Drawing	3	131	II
Shopwork	3	156	XIV*c*	Shopwork	3	156	XIV*d*
Chemistry	5	114	I	Chemistry	5	114	I
Physics	5	164	I	Physics	5	164	I
Gas Engines	5	154	XI	Vapor Engines	5	154	XI

SECOND YEAR.

Motor Design	15	155	XII	Motor Design	10	155	XII
Laboratory	3	155	XIV	Laboratory	3	155	XIV
Gas Engine	3	155	XIII	Gas Engine	3	155	XIII
				Engines and Boilers	3	154	X

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DEPARTMENT OF ELECTRICAL ENGINEERING

The remarkable development of electrical industries during the past few years has created a demand for men skilled in the theory and practice of electrical and mechanical work. The study of the subjects arranged in the program of Electrical Engineering is intended to give a general education as well as a special training in the technical branches involved in the various practical applications of electricity in industrial operations.

General theory is given in lectures and by recitations from standard text-books. In the laboratories and shops the operations explained in the class room are performed by the student, in doing which he acquires skill in handling tools and instruments, and obtains a working knowledge of the principles involved. Careful records of the work done in laboratories are kept by the student and are handed in for suggestions and corrections at the end of every week.

The University is located near a great manufacturing center in the growth of which electricity is taking a very prominent part. Electric power generated by steam is now being distributed and utilized in several large plants, some using the three phase alternating system, while others are using the direct current. One of the largest water power developments in the Middle West is situated within a few miles of the University. From this establishment we receive three phase alternating currents which furnish light for our buildings and grounds, and power for driving motors in our shops and printing offices, etc., all of which are operated by electricity.

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There are numerous other transmission lines and electrical power plants operated by water power within a short distance. Our students visit all of these plants, accompanied by an instructor who points out the applications of the text-book theory in the design of electrical apparatus and its operation under actual working conditions.

Each candidate for graduation must present at the end of the Senior year an acceptable thesis embodying the results of an extended original research on an engineering subject, chosen at the beginning of the year, with the approval of the head of the department. The descriptive part must be typewritten on legal cap paper, and bound in book form together with the drawings.

The equipment for the laboratory work in electrical engineering includes dynamos typical of the various classes, accessory apparatus and measuring instruments as follows: A three phase A. C. induction motor arranged to operate on single phase circuits with a condenser compensator, a high frequency 1000 V. 33 K. W. composite wound Wood alternator of the latest type with exicatter and a full set of switchboard instruments, several transformers of different capacity, a high tension transformer for testing insulation. an Edison bipolar 15 K. W. 125 V. generator, a Thompson-Houston arc light machine with regulator and fifteen lamps, a Wood arc transformer for testing insulation, an Edison bipolar 15 machine capacity 25 lights, an Edison bipolar 3 K. W. 125 V. dynamo with special winding, a Van Depoele compound wound dynamo, a special A.C. 5 H. P. dynamo or rotary converter, a series wound dynamo with wrought iron field, number of small motors, a forty horse power high speed automatic engine, a set of inclined coil alternating current portable instruments voltmeter, ammeter

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and wattmeter, telegraphing relays, sounders, switchboards, etc., telephone apparatus including subscribers sets of various modern types, a fifty drop manual switchboard complete and a lot of separate drops, jacks, switches, lightning arresters, etc., automatic telephone switchboard containing first and second selector and connector switches, interrupter heat coils, etc., and three subscribers sets—with this apparatus all the operations involved in the operation of a 10,000 system may be performed, a complete central energy switchboard, several lines and subscribers sets and a selective signaling four party line outfit, a collection of historical sets including Reis' transmitter and receiver, a standard portable bridge, a common portable bridge, a testing battery, a power or foot lathe with wood turning tools, drills and hand tools for metals, a set of tools for metal working, a calibrating lamp rack, a D'Arsonval and common galvanometers, Ballistic galvanometer, standard condenser, etc., for capacity work, resistance boxes, standard megohms, etc., high resistance Thompson galvanometer, standard cells, voltmeter arranged for the comparison on incandescent lamps, a plug switchboard controlling all circuits, a small engine belted to shafting to drive a plating dynamo and a buffer for cleaning and polishing work to be plated, solution tank, etc.,—in all, a complete outfit for electrotype work, a hot wire ammeter, twelve ammeters and voltmeters mostly of the Weston type for direct current measurements, a set of wood working tools, a Kohlrausch bridge for measuring battery resistance, etc., a lot of arc lamps series and constant potential open and enclosed arcs of various wattmeters of various types, a collection of motor starting rheostats, several sets of parts of incandescent lamps showing the various stages in their manufacture, a large collection of porcelain insulators used in electrical

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work including a lot of insulators for high tension transmission lines, a lot of armature core disks, transformer core stampings, formed coils, brush holders, pole pieces, samples of insulation, commutator segments, etc., used in dynamos of good design, donated by leading manufacturers of electrical machinery, a case of marked samples of wire insulators, lamps, and other construction materials, a library of practical technical books of reference and files of leading periodicals and trade publications, a Cooper Hewitt mercury vapor lamp, a high frequency Tesla coil and condenser, a working model of the induction motor showing the action of the rotating field, a transmission dynamometer capacity 1-4 to 10 horse power for determining the efficiency of small dynamos, a full size armature winding models mounted to rotate in bipolar and multipolar fields, a storage battery 25 cells with universal switch to connect for various voltages.

For the work of electricity and magnetism in the courses in physics there are the following: An absolute electrometer, a Holtz machine and apparatus for illustrating static phenomena, four induction coils, six bridges of different types, several ammeters and voltmeters, one 2,000 lb. electro magnet, standard resistance coils, a historical set of motors showing evolution of the modern machine from the early forms of the reciprocating type, ten galvanometers of various types, a complete X-ray outfit, a set of apparatus for wireless telegraphy. For further apparatus consult pages 48 and 49 of this catalogue

For the work in chemistry, drawing and shopwork, the equipment and facilities will be found described on pages 46, 66, 69 and 70.

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STUDIES PRESCRIBED FOR THE DEGREE OF MECHANICAL ENGINEER IN ELECTRICAL ENGINEERING.

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
FRESHMAN YEAR							
Algebra	5	148	I	Analyt. Geom.	5	149	II
French	5	169	I	French	5	169	I
Drawing	3	131	I	Drawing	3	131	II
Chemistry	4	114	II	Chemistry	4	114	II
Shopwork	3	155	XIV*a*	Shopwork	3	155	XIV*b*
SOPHOMORE YEAR							
Calculus	5	149	III	Calculus	5	150	IV, V
Des. Geom.	4	131	III	Des. Geom.	4	131	III
Physics	5	165	II, III	Physics	5	165	II, III
Shopwork	3	156	XIV*c*	Shopwork	3	156	XIV*d*
JUNIOR YEAR							
Analytic Mechanics	5	122	VIII	An. Mechanics	2	122	VIII
Kinematics	5	153	V	Mech. of Mat.	3	123	X
English	3	137	I	Machine Design	5	153	VI
Physics	3	165	IV	English	3	137	I
Shopwork	3	156	XIV*e*	Physics	3	165	IV
				Shopwork	3	156	XIV*f*
SENIOR YEAR							
Dynamo Machinery	5	134	III	Dynamo Machinery	5	134	III
Thermodyn'm	5	151	I	Electrical Lab.	5	135	IV
Electrical Lab.	5	135	IV	Designing	5	135	V
Designing	3	135	V	Thermodyn'm	5	151	I
Thesis				Thesis			

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SHORT PROGRAM FOR APPLIED ELECTRICITY

Students who do not wish to take the languages and higher mathematics required in the regular four-year program should take up the Short program, which may be completed in two years. The studies are arranged to give an accurate knowledge of the fundamental theories of electricity and magnetism, as well as a certain amount of skill in handling electrical machinery and appliances. Algebra, geometry, trigonometry, and elementary physics are included, for they are necessary in order to carry on successfuly the practical work of designing, manufacturing and testing or operating electrical apparatus. Training in this practical work is given in the drafting room, the machine shops, and in the electrical and physical laboratories.

The actual conditions of the commercial application of electricity to the distribution of light and power are learned by testing, repairing and making additions to the University plant, and by visiting the numerous electric establishments in the vicinity, accompanied by an instructor.

The study of the principles of mechanical drawing is taken up early in the program and sufficient practice is given to enable the student to make working drawings and to follow them in the construction of apparatus in the shops and laboratories.

Applicants for admission to the Short program should be at least 17 years of age. They should have a fair knowledge of the subjects taught in the common schools, especially arithmetic and algebra, as far as quadratics.

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They shall also write a short essay which must be satisfactory in spelling, punctuation, sentence and paragraph completed, a certificate of proficiency is issued.

When the required studies have been satisfactorily completed, a certificate of proficiency is issued.

The laboratory fees for students who are taking the regular work in the program, according to the following schedule, after they have finished all the work required for entrance, shall be as given on page 63.

All others are special students and for them the fee is as given for applied electricity on page 34.

STUDIES PRESCRIBED FOR SHORT PROGRAM IN APPLIED ELECTRICITY

FIRST YEAR.

SUBJECTS First Term	Hrs. a Week	See for Description		SUBJECTS Second Term	Hrs. a Week	See for Description	
		Page	Course			Page	Course
Algebra	5	190	C	Geometry	5	190	D
Drawing	3	131	I	Drawing	3	131	II
Shopwork	3	155	XIV*a*	Shopwork	3	155	XIV*b*
Physics	5	164	I	Physics	5	164	I
Applied Electricity	5	133	I	Applied Electricity	5	133	I

SECOND YEAR.

Trigonometry	5	191	H	Engines and Boilers	3	154	X
Designing	3	135	V	Designing	3	135	V
Shopwork	3	156	XIV*c*	Shopwork	3	156	XIV*d*
Dynamo Machinery	5	134	III	Dynamo Machinery	5	134	III
Applied Electricity	5	134	II	Applied Electricity	5	134	II

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COLLEGE OF

ARCHITECTURE

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THE COLLEGE OF ARCHITECTURE

Architecture is, fundamentally, a fine art; but it is a fine art that may be expressed on so large a scale that a deep and comprehensive knowledge of engineering science is necessary to make its expression stable.

The Master-Artist is the heaven-gifted man who, having conceived his projects in ultimate beauty of form, color, texture, and ornament, can build them structurally and economically perfect. It is seldom that any mind combines all of these attributes. It is more seldom that to-day's practice requires them in any one man. To-day, one man "designs"; another "frames."

It is the recognition of these two almost independent phases of Architecture that has caused the University of Notre Dame to detach the Program in Architecture from the College of Engineering and to create the new College of Architecture.

The Faculty of the College now offer three undergraduate programs and two graduate programs to men able to furnish the entrance requirements. The program in design requires four years for completion and is offered to students wishing to specialize in design; the degree of Bachelor of Science in Architecture is given at completion. The Engineering Program is of the same length and is offered to men wishing to specialize in construction; the degree is Bachelor of Science in Architectural Engineering. Graduate years are offered in both programs, and upon completion, Masters' degrees are conferred. A Short Program covering two years is offered to students finding it impossible or inexpedient to devote to school work the time required for completing the programs leading to degrees. Upon completion of the Short Program a Certificate of Proficiency is given.

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The general scheme of the courses provides for work in the draughting-room continuously during the morning hours from 8 to 12, and for periods of class-room work in the afternoon. In the Senior Years and in the Short Program the class-room requirements are less and the time to be spent in the draughting-room correspondingly lengthened.

Students matriculating for the Short Program or either of the complete programs must be at least eighteen years of age and must have completed the work preparatory to the programs either in the Preparatory School of the University or in another accredited school; or, entrance may be by examination at the University on the first two days of the Fall Term or in Chicago at the offices of the University on days announced in the press of that city.

Students may not matriculate with more than one condition, and any condition interfering with the routine of the courses must be worked off privately.

For students matriculating with advanced standing there must be a corresponding increase in the age-limit.

Students taking the work of either of the graduate years must have received their Bachelor degree in Architecture, or in Architectural Engineering, from Notre Dame or another School of Architecture of equal standing. The University will confer the Master's degree on her own graduate students not in residence at the end of one year if that time is spent in an *atelier* of the first order or in travel abroad following an approved program of study and investigation; or at the end of not less than two years if that time is spent in practice and the University's requirements are complied with.

EQUIPMENT.

The equipment of the College of Architecture, from a small beginning, is rapidly becoming more and more

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complete. There are a number of signed drawings—some from the *Ecole de Beaux-Arts,* others from architects of national reputation; a large elaborate model complete in all its details of the new County building in Chicago; photographs, engravings, plaster models, reference books and manufacturers' catalogues and samples. The collection, however, needs to be increased faster than the resources of the University will permit. Philanthropic friends of Notre Dame can not give money, or its equivalent, for a better purpose. The endowment of a Traveling Fellowship, preferably for the study of European Ecclesiastical Architecture, will be a benefaction of the utmost value. One thousand dollars will provide for one man for one year.

ENTRANCE REQUIREMENTS.

Candidates for the Freshman Year in either four-year program, or for the First Year of the Short Program must be prepared to pass an examination in the branches named below, unless they have done their preparatory work at Notre Dame or in an accredited High School.

ENGLISH. Part of the examination time is given for answering questions upon books required to be read in the preparatory courses in English; the remainder for writing an essay.

ALGEBRA. Fundamental operations, simple equations, involution and evolution, radicals, radical equations and quadratic equations, including everything up to logarithms, as given in *Wentworth's College Algebra,* or of an equivalent in the larger treatises by other authors.

GEOMETRY. Plane and Solid.

TRIGONOMETRY. Plane and Spherical.

HISTORY. A general knowledge of the outlines of Greek and Roman History and of Medieval and Modern

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history, as set out in the texts used in the high schools and academies of the country.

GEOGRAPHY. Physical, as much as is contained in the ordinary text-books.

PHYSIOLOGY. *Martin's Human Body,* or an equivalent.

BOTANY. Elementary.

ZOOLOGY. Elementary.

CHEMISTRY. Elements of inorganic chemistry, as given in high schools of good standing.

PHYSICS. Elementary. The preparation on this subject should include a course of lectures illustrated by experiments, and recitations from a text book similar to *Carhart and Chute's* or *Gage's.* Laboratory work is also required.

CIVICS. Elementary.

GERMAN. A three year's course in German is required. Ability to translate at sight German into English, and easy English sentences into Germon.

FRENCH. An equivalent course in French or any other language may be offered for German.

DRAWING. A knowledge of the use of drawing instruments, of elementary projection drawing and free-hand.

The Program of Studies Preparatory to the Programs in Architecture is outlined and described in this Bulletin immediately following the description of the College work.

It is strongly urged that Students desiring to matriculate for the Architectural Programs complete the First Year Courses in Descriptive Geometry, Shades and Shadows, Perspective and Elements of Architecture while pursuing their Preparatory work. They will thus be enabled to get four years instruction in Design instead of three. The value of the fourth year is equal to that of any other two. Prospective Students who are not doing their Preparatory work at Notre Dame may arrange by addressing the Professor of Architecture to complete their Courses by Correspondence.

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THE PROGRAM IN DESIGN.

DEGREES: Bachelor of Science in Architecture.
Master of Science in Architecture.

It has been the aim of the College in offering this program so to design it that the student pursuing it will have upon completion a liberal general education, a practical working knowledge of Construction, and a systematic and thorough training in Architectural Design and Composition. It may be undertaken by students whose artistic intuition and temperament fit them especially for the aesthetic side of a noble profession.

The course is built up around the work in the draughting-room and *atelier,* where half of the student's time is spent. The work in Design, beginning in the Freshman year with the intelligent study of the orders and simple problems involving their combination and use, and continued in the three following years by means of minor and major problems involving the planning of all classes of buildings from the simplest to the most monumental, is supplemented and rounded out by exercises in the various methods and media of rendering and by a thorough course in freehand and modeling. All instruction in planning and composing is based on correct principles of design.

The materials and methods of all trades and professions engaged in building operations are systematically studied in the Construction classes throughout the four years of the program. The writing of specifications for each branch of labor is studied synchronously. Practical work in the various trades is given so that the student

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may know good work and thus be able to superintend construction intelligently. The practical lessons are supplemented by weekly inspection trips to the important building operations and industries in the neighborhood of the University.

The standard hand-books and mill-books are used as supplementary text-books.

Graphic methods of determining stresses in beams, girders and trusses of all forms are studied and numerous practical problems solved.

Working drawings and details of construction are made under office conditions.

Broadly speaking, it is the purpose of the College in outlining the construction courses to equip the student to solve by *office methods* any problem he may meet in ordinary practice, it being taken for granted that graver problems requiring a deep knowledge of the higher mathematics may well be left to the architectural engineer.

In the last year of the program a series of lectures are given on estimates, contracts, law, business relations, and professional ethics and practice. Architects of high professional standing will give a number of the lectures in this course.

The history of architecture and of the allied arts is studied in a course covering four years. The method is a combination of lectures, recitation and research.

Courses either in mathematics or in English (with Electives as noted below) covering four years complete the curriculum.

In the Graduate Year advanced work in criticism and research is done and larger and more complicated problems are given in design.

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ENGINEERING PROGRAM

DEGREES: Bachelor of Science in Architectural Engineering.
Master of Science in Architectural Engineering.

The science of engineering has long since outgrown the practical limit of one man's abilities. To be thorough, the engineer must specialize. One of his specializations is in Architecture. His services are needed to frame important buildings, to design their foundations and to protect adjoining property while they are in erection. The modern idea of education is to progress in a course parallel to the world's needs. The College offers the Program in Architectural Engineering because there is need of the services of the men who can complete it.

Students desiring to become Architectural Engineers should have a bent for mathematics and for painstaking, exact draughting.

The program of studies differs from that of the Program in Design chiefly in the following particulars: Courses in pure and applied mathematics are substituted for the courses in English, economics and philosophy; the more important construction courses go deeper into theory; fractional work ends with the first pear; the historics of ornaments and the "allied arts" are omitted; and a relatively greater amount of time, increasing each year, is spent in structural design.

The Graduate Year is spent entirely in the solving of problems of the first order in architectural engineering.

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THE SHORT PROGRAM

Certificate of Proficiency.

The scheme of studies for the Short Program comprises most of the work of the complete program that is essentially architectural. A glance at the Program will show that there is relatively less class-room work and correspondingly more in Design each year than in either of the complete programs.

SUMMER WORK

Summer, or Vacation Work, consisting of sketches, projects, measured drawings or work in an architect's office will be required of all students of architecture.

EXPLANATION OF "HOURS"

A class hour means one hour of recitation or lecture and one to two hours of preparation. A freehand or design hour means two actual hours in the draughting-room.

It is the intention to have the student work steadily for four hours in the draughting-room during the morning session and to attend recitation periods in the afternoon session.

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PROGRAM IN DESIGN.

FIRST YEAR.

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
Hist. of Arch.	2	109	I	Hist. of Arch.	2	109	I
Construction	3	106	I	Construction	3	106	I
Des. Geom. / Perspective	1	131	III	Shades and Shadows	1	131	III
Freehand	1	131	I	Freehand / Pen-and-Ink	1	131	I
El. of Arch.	8	109	I	El. of Arch.	8	109	I
English	3	137	I	English	3	137	I

SECOND YEAR.

Hist. of Arch.	2	109	II	Hist. of Arch.	2	109	II
Adv. Cons.	2	107	II	Adv. Cons.	1	107	II
Graphics	2	126	I	Graphics	1	126	I
Freehand / Water Color	1	131	II	Theory Design	1	110	I
Design	8	110	II	Freehand / Modelling	1	130	I
English	3	138	II	Design	8	110	II
				English	3	138	II

THIRD YEAR.

Hist. of Orna.	2	109	III	Elective	4		
Adv. Cons.	1	107	III	Hist. of Art	2	109	III
Heat. and Vent.	2	108	I	Adv. Cons.	1	107	III
Electricity	1	133	I	Sanitation	1	108	I
Freehand	2	131	III	Freehand / Modelling	2	130	III
Design	8	110	III		2	130	II
Elective	4			Design	8	110	III

FOURTH YEAR.

				Elective	3-5		
Elective	3-5			Bu. Relations and Prof. Ethics	2	108	I
Hist. of Art	2	109	IV				
Freehand	2	131	IV	Freehand	2	131	IV
Design	10	110	IV	Design (Thesis)	10	110	IV

At the beginning of his First Year, the student matriculating for the Program in Design may, with the consent of the Faculty, elect a Major in Mathematics instead of the Major in English. The Mathematics courses for the four years will be as follows: Algebra, I; Analytic Geometry, II; Calculus, III, IV, V; Physics, II, III; Analytic Mechanics, VII; Mechanics of Materials, X.

At the beginning of his Third Year, the student following the regular Program in Design may, if his proficiency in English warrants it, elect to follow during his Third and Fourth Years one of the following courses: English, Philosophy, Political Science, any History, French, German or Spanish. He may not, however, elect a course in the same language that he offered for credit at matriculation. If the above election is denied the student, he must continue his work in English for one or two years more as may be decided by the Faculty.

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PROGRAM IN ARCHITECTURAL ENGINEERING

FIRST YEAR.

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
Algebra	5	148	I	Anal. Geom.	5	149	II
Des. Geom.	3	131	I	Des. Geom.	3	131	I
Construction	3	106	I	Construction	3	106	I
Perspective			III	Shades and Shadows			III
Water Color	1	131	I	Pen-and-Ink	1	131	I
Freehand			I	Freehand			I
El. of Arch.	8	109	I	El. of Arch.	8	109	I

SECOND YEAR.

Calculus	5	149	III	Calculus	5	150	IV, V
Physics	5	165	V, III	Physics	5	165	II, III
Adv. Cons.	3	107	II, III	Adv. Cons.	2	107	II, III
Design	7	110	II	The'y of Design	1	110	I
				Design	7	110	II

THIRD YEAR.

Anal. Mechan.	5	122	VIII	Anal. Mech.	2	122	VIII
Sanitary Eng.	2	125	VIII	Mech. of Material	3	122	X
Electricity	1	133	I	Sanitary Eng.	2	125	XIII
Heating and Ventilating	2	108	I	Surveying	3	121	II, III
Hist. of Arch.	2	109	I	Hist. of Arch.	2	109	I
Struc. Design	8	110	V	Struc. Design	8	110	V

FOURTH YEAR.

Arch. Eng.	2	107	IV	Arch. Eng.	3	107	IV
Bridges and Roofs	5	126	XIV	Graphics	5	126	XI
Stereotomy	3	132	VI	Hist. of Arch.	2	109	II
Hist. of Arch.	2	109	II	Bu. Relations and Prof. Ethics	2	108	I
Struc. Design	8	108	VI	Thesis Design	8	110	VI

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SHORT PROGRAM

FIRST YEAR.

SUBJECTS First Term	Hrs. a Week	See for Description: Page	Course	SUBJECTS Second Term	Hrs. a Week	See for Description: Page	Course
				Hist. of Arch.	2	109	I
Hist. of Arch.	2	109	I	Construction	3	106	I
Construction	3	106	I	Shades and Shadows	1	131	III
Des. Geom. / Perspective	1	131	III	Pen-and-Ink / Freehand	1	131	I
Freehand	1	131	I	El. of Arch.	4	109	I
El. of Arch.	12	109	I	Design	8	110	II

SECOND YEAR.

				Hist. of Arch.	2	109	II
Hist. of Arch.	2	109	II	Adv. Cons.	3	107	II, III
Adv. Cons.	3	107	II, III	Graphics	1	126	I
Graphics	2	126	I	Sanitation	1	108	I
Heat. and Ventilation	2	108	I	The'y of Design	1	110	I
Electricity	1	133	I	Bus. Relations and Prof. Ethics	2	108	I
Freehand / Water Color	1	133	II	Freehand / Modelling	1	130	II
Design	1	133	I		1	130	I
	8	110	II	Design	8	110	III

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COLLEGE OF LAW

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THE COLLEGE OF LAW

For several years a systematic movement has been in progress, under the auspices of the bench and bar of the country to elevate the standing and promote the efficiency of the legal profession, and make it as learned in fact as it is in name. The most essential preliminary step to this end, as lawyers generally agree, is to prescribe requirements and examinations more comprehensive and rigorous as a test of qualifications for admission to the bar. Under the influence largely of the American Bar Association, the period now commonly prescribed for the study of law in a college is three years.

A period of three years study is prescribed for undergraduates in the College of Law of the University of Notre Dame. The courses lead when satisfactorily completed, to the degree of Bachelor of Laws. The Graduate program comprises an additional or fourth year, and leads to the degree of Master of Laws.

On account of the peculiarly favorable location of the University for diligent and persevering work, it is possible for industrious students to do at least a fourth more in a year than is elsewhere attempted.

The undergraduate law students are divided into three classes, corresponding to each year of the program leading to the degree of Bachelor of Laws. The Graduate course is for students who have received that degree and aim at attaining, by further study and practical work, to a higher grade of proficiency. A full year of study in each class is obligatory. Moreover, the student must pass a satisfactory general examination at the close of each scholastic year. Graduates entitled to vote are admitted

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to the bar on motion of the Supreme Court of Indiana.

Candidates for degrees in the College of Law are admitted to the first year on presentation of a certificate of graduation from some High School accredited to the State Universities or by examination on subjects scheduled in any of the programs of the Preparatory School at Notre Dame. Certificates showing that the candidate has completed subjects required in any of the four year programs of the Preparatory School at Notre Dame, or of any other reputable preparatory school giving equivalent courses, will be accepted in lieu of examinations.

Students from other reputable law schools are received at any time and allowed due credit for the work previously done. They must, however, be in residence for at least one year in order to be entitled to degrees.

Lawyers who have been engaged in the practice of the profession or have only been admitted to the bar, as the case may be, are admitted to the Senior class and entitled to the degrees appropriate to their work and standing at graduation in the following June.

SPECIAL STUDENTS

Students who do not intend to become candidates for the degree of Bachelor of Laws, but wish simply to add to their educational acquirements a knowledge of the fundamental principles of law, may at any time in the year have their names enrolled on the list of special students. No extra expense is thereby incurred. Yet they must be sufficiently advanced in age and education to justify the belief that they can understand and appreciate instruction in the law. No particular academic entry requirement is prescribed for them, aside from securing the consent of the Director of Studies and being of sufficient age and

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capacity to understand and profit by instruction in the law. The number of such students is likely to increase steadily, for year by year it is becoming more manifest that an education is not complete without a knowledge of at least the elementary legal principles. Many a person has been forced to do exactly the contrary of what he intended through his failure to understand the essential elements of a contract. Many a one has been compelled to pay heavy damages for personal injuries caused by negligence, or failure to perform a duty, or improper performance of it, where no liability would exist if the law of torts had been known and observed.

METHODS OF INSTRUCTION

The study of cases is usually begun in September and continues long enough to enable students to understand, analyze and criticise the decisions assigned to them for study and recitation. Lectures and explanations supplement this work. After thus familiarizing themselves with cases, they are expected to read the authorities cited daily in class, whether in the text-books, lectures or quizzes. In the preparation also of written theses from month to month, comprising on an average fifteen pages of legal cap, they must necessarily consult and cite them. In moot-court work, likewise, they are prepared for actual practice by making a careful study not only of the cases in the reports, but also of those cited in text-books and digests.

In examinations for admission to the bar the courts of some States require applicants to furnish lists of the text-books they studied, and such as have merely attended lectures or studied cases, instead of reading text-books, encounter danger of being declared ineligible to appear for examination. As many law students

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come from States in which this test is applied, the use of text-books is deemed necessary. The books used by students become peculiarly serviceable in their subsequent practice. They may be purchased in the Students' Office at the University at the lowest retail prices. The cost may be estimated at $20 or $25 a year.

The lecture or dictation system alone is regarded at Notre Dame as impracticable but, in combination with text-book work, case readings and daily examinations, its great value and utility can not be overestimated. Each subject is fully covered by lectures, text-book work, weekly quiz, monthly theses, bimonthly examinations, the reading of pertinent cases and formal trials in the moot court and other courts of the College. Students have also the advantage of attending important cases in the higher courts of South Bend.

The course of instruction is comprehensive, thorough and practical. The earnest and industrious student can accomplish twice as much in a given time at Notre Dame as he can in an office or at home. With comparative immunity from the distractions and temptations of city life, he can give his entire time to study and necessary recreation. In short, he can here study a greater number of hours and do more class work day by day than probably anyhere else in the country.

Students have from three to four recitations daily, based upon the text-books, the books of selected cases, the questions answered in writing or the subjects dealt with in the lectures. From one to two hours additional must be devoted daily to office and library work, while four hours weekly are required for moot court practice and exercises of the law debating society. While this society and the moot court offer exceptional opportunity and strong incentive to acquire readiness in debate, fluency in speech and force in forensic oratory,

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yet much benefit may be derived from attending the regular classes in elocution and oratory in the College of Arts and Letters.

When a subject is regularly begun in the Law Program it is studied and kept before the class, with recitations day by day at the same hour, until finished. It is believed that in this way the mind follows it more closely and that it is better understood than it would be if frequently interrupted by the intervention of other and dissimilar subjects.

THE MOOT COURT

All students are required to attend and participate in the exercises of the moot court. Students of the first year are expected to serve on juries and as witnesses, while those of the second year assist the Seniors and Graduates in the conduct of the trials. The court is fully organized, having a judge, clerk, state's attorney, sheriff, coroner and reporter. Pleadings are filed in the clerk's office, served and returned by the sheriff, brought to an issue with due formality by the attorneys, and the trial proceeds under the rules of evidence before a member of the Faculty acting as judge.

In addition to the moot court, which corresponds to the ordinary circuit or trial court, there is a fully-equipped court of equity, with its chancellor, clerk, master-in-chancery, bailiff and reporter.

There is likewise a justice's court. This comprises the justice of the peace, clerk and constable.

The Federal judicial system is also represented. The United States District Court, for example, has its district judge, clerk, district attorney, marshal and reporter.

The course of procedure in these courts follows as closely as practicable the actual procedure in the courts they represent. Practice is combined with theory in

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their work. The statement of facts in the cases tried are furnished by the Faculty. Students acquire in this way a knowledge of the customary procedure in the regular courts.

THE LAW LIBRARY

There are undoubtedly in the country several law school libraries considerably larger than the library at Notre Dame, but it may well be questioned whether any of them shows any more care in the choice of books, or is better adapted for the use of students. All the latest reports of State and Federal courts are on its shelves, and no difficulty is experienced at any time in finding the cases needed for reference, thesis writing and moot court work. A great library, with a crowdingly large attendance of students—too many to be personally known by or to have personal attention from the Faculty—may often be less available for use or accessible than a comparatively small one. It happens sometimes in such cases that twenty or more students are found vainly scrambling at the same time to secure possession of a particular report or text-book. Such experience, fortunately, does not fall to the lot of the young men studying at Notre Dame. Not only all the latest reports, but likewise the leading text-books, are to be found on the library shelves.

The books may be read in the library or used in Moot court trials, but must not be carried to private rooms, nor hidden in desks. This rule is rigidly enforced by the librarian. It is intended for the advantage and to facilitate the work of the students in common, for all have a right to feel reasonably certain that when a book is needed it can be found in the library.

The books on the shelves of the law library number 3,500, but so carefully have they been selected that

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they may be said to surpass in practical utility many libraries twice as large. The library adjoins the law lecture room. It is practically open all day and until 9:30 o'clock at night. The light and ventilation are excellent, and students find it a very wholesome and comfortable place in which to study.

In addition to the law library, the general library of the University is open, likewise, at all reasonable hours to law students. The library privileges are on a generous scale, and students are not specially charged for making proper use of the books, but if a book be lost or injured through negligence the cost of the book is charged to the borrower.

THE LAW DEBATING SOCIETY

holds its meetings on Wednesday evenings. All students of the College are members of it. They are required, each in his turn, to participate in its debates and other exercises. The debates commonly deal with questions germane to the law, but subjects of history, political economy, and the like, are also discussed. An excellent opportunity is afforded at the meetings of the society to develop skill, power and fluency in public speaking. One of the professors usually presides and aids the members with his counsel and suggestions. A Parliamentary Law meeting, with exercises in public speaking and debating, takes place each Wednesday afternoon.

THE COURSES IN LAW

The following plan is observed in the courses given in the College of Law. The text-books used are noted after each subject. A special recitation is held each day for first year men, and is so noted in the schedule which

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follows; a like arrangement obtains for third year men.

1906-07 AND EVERY SUCCEEDING YEAR.

(Each subject five hours a week until finished.)

Kent's Commentaries, *Browne* (for beginners).
Persons and Domestic Relations, *Tiffany.*
Contracts, *Clark.*
Torts, *Hale.*
Criminal Procedure, *Clark.*
Criminal Law, *Clark.*
Real Property, *Hopkins.*
Medical Jurisprudence, Lectures.
Natural Law and Legal Ethics, Lectures.
Sales, *Case System.*
Moot Court Practice weekly.
Parliamentary Law weekly.
Monthly Thesis.

1907-08 AND EVERY SUCCEEDING THIRD YEAR

(Each subject five hours a week until finished.)

Blackstone's Commentaries, *Blickensderfer.* (For beginners.
Common Law Pleadings, *Shipman.*
Agency, *Tiffany.*
Partnership, *George.*
Private Corporations, *Clark.*
Public Corporations, *Ingersall.*
Insurance, *Vance.*
Bailments and Carriers, *Hale.*
State and Federal Courts.
Federal Procedure, *Hughes.*
Interpretation and Construction of Laws, *Black.*
Moot Court Practice weekly.
Parliamentary Law weekly.
Monthly Thesis.

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1908-09 AND EVERY SUCCEEDING THIRD YEAR

(Each subject five hours a week until finished.)

Elements of American Jurisprudence, Robinson. (For beginners.)
Equity Jurisprudence, *Fetter.*
Code Pleadings, *Case System.*
Damages, Notes from Lectures.
Commercial Paper, Bills, Notes and Checks.
Bankruptcy, Insolvency and Receivers.
Constitutional Law, *Black.*
International Law, *Glenn.*
Criminal Law, *Clark.*
Equity Pleadings, *Shipman.*
Evidence, Civil and Criminal, *Case System.*
Wills, *Gardner.*
Executors and Administrators, *Croswell.*
Suretyship and Guaranty, *Pingrey.*
Moot Court Practice weekly.
Parliamentary Law weekly.
Monthly Thesis.

GRADUATE COURSES cover the entire field by way of review, together with Moot Court practice, office work, etc. The optional studies include Roman Law, Admiralty, Mining and Water Rights, Copyright, Patents, Trademarks, State and Federal Statutes, etc.

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COURSES OF INSTRUCTION

(In the description of the courses of instruction an hour means forty-five to sixty minutes in the recitation or lecture room and one hundred and twenty minutes in the laboratory, the drawing room or the shop. A term means a half year.)

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ANATOMY

I.

HUMAN HISTOLOGY. Laboratory work and demonstrations. Preparations of the tissues and organs of the human body given to each student, and their structure demonstrated. This course is taught in connection with Course I. under Human Physiology.

II.

HUMAN HISTOLOGY. Lectures, recitations and laboratory work. The work covers a thorough course in Normal Histology, with the methods of hardening, staining, embedding, section cutting, and mounting of tissues. Careful work on the nervous system—brain and spinal cord, termination of nerve fibers, etc. Drawings made from each preparation. Text-book, *Piersol.*

[Two laboratory hours a week for two terms.]

III.

HUMAN ANATOMY. Lectures and Recitations. Osteology and the descriptive anatomy of the muscular, vascular and nervous systems and of the organs of special sense. The anatomy of the viscera. Text-book, *Gray.*

[Three hours week for four terms.]

ARCHITECTURE

I. AND II.

CONSTRUCTION. In these courses the student obtains a thorough knowledge of the materials and methods of the mason's, carpenter's, metal worker's and painter's trades. Each trade is considered separately, and at con-

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clusion an exhaustive study of specification writing and methods of estimating for it is made. The University constantly furnishes employment to a large force of trained mechanics who will give personal lessons to the student in all branches of these trades. Inspection visits are made weekly, as a supplementary exercise in superintendence, to important building operations in the neighborhood. Detail drawings of constructive methods are made exactly as in an architect's office.

In the spring terms of his last three years each student is required to stake out on the campus one of his projects and to furnish all levels required by the builder in order to acquire thoroughness in the use of the architect's level and compass.

[Two hours a week for four terms.]

III.

ADVANCED CONSTRUCTION. In this course the student studies the construction and design of steel framing, fireproofing of all forms, reinforced concrete, footings and foundations.

Working drawings for one of the student's projects are made. Especial care and accuracy are demanded in the preparation of the framing plans and details. This work is traced and blueprinted by Freshmen students.

[Two hours a week for four terms.]

IV.

ARCHITECTURAL ENGINEERING. A course in which are solved graphically and analytically more complicated problems in structural design and applied mechanics, with especial study of reinforced concrete.

[Five hours a week for two terms.]

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V.

SANITATION. This subject is taught from text-book and embraces sanitary engineering pertaining to buildings, as follows: sewerage, water supply, lighting and ventilation, plumbing work, subsoil drainage, dry foundation walls and cellars; also drawings of plumbing systems and fixtures.

[Two hours a week for one term.]

VI.

HEATING AND VENTILATION. This course is a study of the theory and practice of heating and ventilating public buildings and dwelling houses. The different systems of heating,—furnace heating, hot water, steam, etc.,—are carefully examined and studied. The radiation of heat from surfaces, the different systems of piping, condition of air as to moisture, amount of air required, causes and best means adopted to secure pure air; the necessity of good ventilation and the latest approved methods for securing this all important feature are some of the topics considered in this study.

[Two hours a week for one term.]

VII.

BUSINESS RELATIONS. This course consists of lectures in which are given descriptions of a system of bookkeeping suited to the needs of an architect's business, a system of building accounts, filing system for catalogues and prints, a card-index system for prints and general information; of forms for agreements with clients, for proposals and acceptances, for contracts and bonds, and for certificates; the laws affecting clients, contractors and architects; and the rules of professional ethics in private practice, competitions and municipal affairs.

[Two hours a week for one term.]

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VIII, IX, X AND XI.

HISTORY OF ARCHITECTURE. This course comprises a study of the early beginnings, growth and development of architectural styles. It includes ethnography as applied to architectural art; ancient architecture; Egyptian architecture; Assyrian architecture; Grecian architecture; Etruscan, Roman and Sassanian architecture; Christian architecture in France, Belgium and Holland, Germany, Scandinavia, England, Spain and Portugal, and Italy; Saracenic and Ancient American architecture; Byzantine architecture.

[Two hours a week for four terms.]

XII.

HISTORY OF ORNAMENT. A study of the origin and evolution of ornament and the application of the same together with exercises in motive.

[Two hours a week for one term.]

XIII.

HISTORY OF ALLIED ARTS. A brief study of the field of art with especial reference to sculpture, metal working, mural painting, stained glass and mosaic.

[Two hours a week for one term.]

XIV.

HISTORY OF CONSTRUCTION. A critical study of the types of construction of the ancient, medieval and modern builders, tracing the relation of the type to the problem and the development of the style from the type.

[Two hours a week for two terms.]

XV.

THE ELEMENTS OF ARCHITECTURE. This course is a study of the Five Orders of architecture and is given by

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lectures, recitations and drawing. The study embraces a thorough analysis of each order, in which the principal and distinguishing features of each are clearly shown and comparisons made. Also a study in detail of the forms and proportions characterizing each is made in the class room. Problems pertaining to the orders are given in the drawing room, and detail drawings and colorings made.

[Eight hours a week for two terms.]

XVI, XVII AND XVIII.

DESIGN. The study of problems in architectural design, embodying the subjects of composition and form. This course expands from Elementary Design (second year) to Advanced Design and Thesis Work (fourth year), and includes the handling of design in monumental structures, and its application to modern buildings, such as hospitals, theaters, municipal buildings, libraries, churches, etc.

The program for the second year requires the execution of nine minor, and nine major problems; that for the third year of nine minor and six major problems; that for the fourth year of four minor and three major problems and the thesis.

Students of the Engineering Program will be given Engineering problems exclusively beginning with the second term of the third year.

[Seven, eight and twelve hours a week, respectively, for three years.]

XIX.

THEORY OF DESIGN. A thorough study of the principles of planning and proportion supplemented by study of the perfection and faults of the world's most famous buildings.

[One hour a week for two terms.]

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ASTRONOMY

ASTRONOMY. Practical. This course is designed to meet the requirements of Civil Engineering students and to give them the training and information necessary for intelligently executing certain departments of work to which they may be assigned in the course of their professional career. The course comprises a study of astronomical instruments as well as instruments of more precision than those used in ordinary surveying. The adjustment and use of these instruments are considered, and instruction is given in methods of observation and computation; problems in finding right ascensions and declination; different methods for finding latitude, longitude and time are studied in detail, and the methods of making the observation and their adjustments, and discussion of errors. Conversion of solar time into sidereal, and sidereal time into solar. In connection with this subject is given a more complete study of many of the topics considered in elementary astronomy, as here they are treated mathematically; as for example, methods for finding parallax, computation of eclipses, altitudes and correction for refraction. The subjects of procession, nutation, annual aberration, proper motion of stars, etc., are studied. Text-books, *Young, Greene.*

[Three hours a week for one term.]

BACTERIOLOGY

LECTURES AND LABORATORY WORK. Lectures on the form, structure, reproduction and classification of bacteria. The relations of bacteria to disease, etc. The principles of sterilization, thermal and chemical, are

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pointed out. The early part of the laboratory work is occupied in the preparation of the various culture media and in studying pure cultures of certain nonpathogenic bacteria in these media. Observations on the microscopic characteristics of bacteria and special attention to the microscopic technique required in bacteriological work. Later on in the course some time is devoted to practice in isolation and identification of pathogenic bacteria. Emphasis is given to the detection of pathogenic germs by the various staining processes. Inoculation of animals. Bacteriological investigation of water, air and soil. Text-book, *Abbott's Principles of Bacteriology.*

[Three laboratory hours a week for one term.]

BOTANY

I.

BOTANY. Lectures and recitations on the morphology of the root, stem, leaf, flower, fruit and seed; the development of the embryo and the processes of pollination and fertilization; the study of the vegetable cell, of its products, of cell formation, of plant tissues and the various physiological phenomena; the structure, growth, reproduction and general classification of the algae, fungi, lichens, mosses, ferns, and the higher plants. Text-book. *Bastin's College Botany.*

[Four hours a week for two terms.]

II.

BOTANICAL LABORATORY. Supplementary to Course I. Special microscopical study of thallophyta, bryophyta, pteridophyta and spermaphyta referred to in Course I. Drawings must be made of all plants examined. Plants under these headings are collected and put before the student that he may become familiar with their mor-

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phology, structure and classification. The course is to accompany or to be preceded by Course I. Provision is also made in this course for students in pharmacy to take a special laboratory course in pharmaceutical botany. Study of the determination and classification of the simpler plants. The analysis of the phanerogams occupies the time during the spring months and the student is made familiar with the habitat and characteristics of the local flora. Text-book for classification of plants. *Kellerman's Spring Flora.*

[One laboratory hour a week for two terms.]

III.

ADVANCED BOTANY. Lectures, recitations, demonstrations. The work of this course is essentially the same as that laid out in *Strasburger's* or *Vine's* text-book of Botany. Special study is made of the physiology, ontogeny, phylogeny, ecology and classification of plants. Text-book, *Strasburger.*

[Three hours a week for two terms.]

IV.

LABORATORY FOR ADVANCED BOTANY. Supplementary to Course III., and either following or accompanying it:

(*a*) PLANT HISTOLOGY AND PHYSIOLOGY. Half of the time allotted for laboratory work is devoted to plant histology and physiology. The student is required to study practically the method of killing, fixing, embedding, sectioning, staining, mounting and drawing of plant tissues. Text-book, *Chamberlain.*

(*b*) PLANT CLASSIFICATION ADVANCED. The other half of the laboratory work is devoted to the determination and classification of the more difficult plants, the compositae, grasses, mosses, myxomycetes, etc. Herbarium study is required, as well as preparing and

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collecting plants for preservation. During spring and autumn frequent excursions into the neighboring fields and woods are made for the purpose of studying and collecting for preservation the local aquatic and land flora. Text-book, *Britton's Manual.*

[One and one-half hours a week for two terms.]

V.

SYSTEMATIC BOTANY. Principally laboratory and herbarium work in special groups of phanerograms and cryptograms. Study of nomenclature and classification of plants. This course is designed to meet the needs or inclinations of students specializing in botany. Library, reference books and seminar work. Original research work.

CHEMISTRY

I.

(*a*) GENERAL CHEMISTRY. A minor course dealing with the general principles of chemistry and embracing a study of only the commoner elements and their typical compounds. Text-book *Remsen's Elements of Chemistry.*

[Three hours a week for two terms.]

(*b*) A LABORATORY COURSE covering in the laboratory the work of the Lecture Course (I. *a.*) and designed to accompany it. *Laboratory Manual, Maguire.*

[Two hours a week for two terms.]

II.

(*a*) GENERAL DESCRIPTIVE CHEMISTRY. Recitations and experimental lectures treating of the fundamental principles of chemistry, and designed to meet the requirements of the students of the College of Engineering. Text-book, *General Inorganic Chemistry, Alexander.*

[Eight hours a week for two terms.]

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(*b*) A LABORATORY COURSE arranged to fit the needs of Engineering students.

[Two hours a week for two terms.]

III.

(*a*) ADVANCED INORGANIC CHEMISTRY. For Biological, General Science and Chemistry students. Lectures and recitations. A complete study of the elements and their most important compounds, following the classification based on Mendeleeff's Law, and including a discussion of the theories of the science. Careful attention is given to the technical chemical processes and industries, and to the writing of chemical reactions. Text book, *Newth's Inorganic Chemistry.*

[Two hours a week for two terms.]

III.

(*b*) EXPERIMENTAL CHEMISTRY. A Laboratory course to accompany Course III. (*a*), the work consisting of the preparation by the student of the elements and their more typical compounds, determination of molecular weights, verification of the fundamental laws of chemistry, etc. During the latter part of the course, special attention is given to the characteristic reactions of the metals and to the principles of chemical analysis. Text-book, *Thorp.*

[Two hours a week, with discussion, for two terms.]

IV.

QUALITATIVE ANALYSIS. The work of this course comprises, in the laboratory, the study of the reactions involved in the separation and detection of the more common inorganic bases and acids, the analysis of salts, mixtures of salts, and complex substances such as earths, lectures.

[Four hours a week, with recitation, for one term.]

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V.

QUANTITATIVE ANALYSIS. A laboratory study of the principles involved in the quantitative separation and estimation of substances, both gravimetrically and volumetrically. Complete analysis of a number of simple salts, like barium chloride, with partial analysis of many complex substances. Text-books, *Appleton* and *Schimpf*.

[Four hours a week, with recitation, for two terms.]

VI.

(*a*) ELEMENTARY ORGANIC CHEMISTRY. Lectures and recitations. A systematic study of the hydrocarbons and their derivatives, and the investigation of their properties. Special attention is given to the aliphatic and aromatic series. Text-book, *Remsen*.

[Three hours a week for one term.]

(*b*) EXPERIMENTAL ORGANIC CHEMISTRY. A course fitted to accompany the preceding, involving the preparation by the student in the laboratory of the most important and typical organic compounds and the investigation of their properties. Text-book, *Gatterman's Manual*.

[Two hours a week for one term.]

VII.

(*a*) URINARY ANALYSIS. A course of laboratory exercises in the methods employed in the detection and estimation of the constituents of urine, pathologic as well as normal. Text-book, *Holland*.

[Three hours a week for one term.]

(*b*) TOXICOLOGY. Symptoms and treatment of poisoning. A chemical and physical examination of the common poisons to familiarize the student with their properties. Attention is also given to their separation from food and animal tissue. Text-book, *Holland*.

[Three hours a week for one term.]

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VIII.

TECHNICAL CHEMICAL ANALYSIS. Advanced courses intended for students specializing in chemistry. Special courses, at the option of the student, in

I. GAS ANALYSIS.
II. WATER ANALYSIS.
IV. COMMERCIAL ORGANIC ANALYSIS.
V. OILS AND FATS.
VI. IRON ANALYSIS.

[Five to fifteen hours a week for two terms.]

IX.

(*a*) ADVANCED ORGANIC CHEMISTRY. An advanced course, intended for students specializing in chemistry. Lectures, recitations and discussions of special subjects of organic chemistry, synthetic chemistry, isomerism, and stereochemistry. Text-books, *Cohen* and special reference works.

[Two hours a week for one term.]

(*b*) ADVANCED ORGANIC LABORATORY. (1) The first term of this course is spent principally in the making of organic preparations by methods demanding special care, skill and accuracy in the student. (2) The second term is devoted to ultimate organic analysis, qualitative and quantitative; analysis of carbon, hydrogen, the halogens, sulphur and nitrogen in organic compounds by the various methods; also in the determination of molecular weights of organic compounds. Text-books, special notes and reference works.

[Ten to fifteen hours a week for two terms.]

X.

GENERAL PHARMACEUTICAL CHEMISTRY. In this course, the chemical bases and their compounds are considered, with special reference to their importance in

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pharmacy and materia medica. Text-book, *Sadtler's and Trimble's Pharmaceutical Chemistry.*

XI.

[Two hours a week for one term.]

(*a*) ELECTROCHEMISTRY. Lectures, experiments and recitations on the principles of electrochemistry and their application in the chemical industries, separation of metals, the preparation of chemical elements and electrosynthesis of compounds. Text-books, *Classen* and *Lüpke.*

[Two hours a week for one term.]

(*b*) ELECTROCHEMICAL LABORATORY. A laboratory course accompanying Course XI. (*a*). Experiments demonstrating the laws and principles of electrochemistry, electrolysis electrosynthesis and electrometallurgy. Quantitative determination of metals electrolytically. Text-books, *Lüpke* and *Classen.*

[Two hours a week for one term.]

XII.

HISTORY OF CHEMISTRY. The subject is divided into topics and epochs of special interest in the development of chemistry as a science. These are discussed at length, together with the biographies of the men who aided in their development. Lectures and recitations. Seminar and journal work for advanced students. Text-book, *Meyer.* References to chemical periodicals.

[Three hours a week for one term.]

XIII.

(*a*) PHYSICAL CHEMISTRY. Lectures, recitations and demonstrations, experiments on the subjects of gas density, solutions, chemical dynamics, the phase rule, thermochemistry, photochemistry, etc. Text-book, *Van Deventer.*

[Two hours a week for one term.]

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(*b*) EXPERIMENTAL PHYSICAL CHEMISTRY. Laboratory work to accompany Course XIII. (*a*). Vapor density methods, calorimetric demonstrations, molecular weight demonstrations by the freezing and boiling point methods, etc.

[One hour a week for one term.]

XIV.

INDUSTRIAL CHEMISTRY. Lectures, recitations and laboratory work. The consideration of chemical manufacture, fuels, etc., and the preparation in the laboratory of chemically pure substances, organic and inorganic. Special reference books and journals.

[Five hours a week for two terms.]

XV.

ADVANCED QUANTITATIVE. Mostly laboratory work in special methods for gravimetric and volumetric determinations of inorganic substances. Special reference work.

[Five hours a week for one term.]

XVI.

RESEARCH WORK. Special facilities are offered to graduate students desiring to do original research work in chemistry, preparatory to the Master's or Doctor's degree.

CHRISTIAN DOCTRINE

All Catholic students are obliged to attend the courses in Christian Doctrine.

FIRST YEAR

MORAL. The Articles of the Creed. The General Principles of Morality. Virtue and Sin. The Commandments of God. Text-book, *Manual of Christian Doctrine.*

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SECOND YEAR

MORAL. The Commandments of the Church. The Evangelical Counsels and Beatitudes. Worship and Means of Sanctification,—Grace, Prayer, the Sacraments, Liturgy. Text-books, *Manual of Christian Doctrine.*

THIRD YEAR

DOGMA. Revealed Religion. Pre-Christian Revelation. The Christian Revelation. The Catholic Church. God Considered in Himself. Text-book, *Wilmer's Handbook of the Christian Religion.*

FOURTH YEAR

DOGMA. God the Creator. God the Redeemer. Sanctification. Grace. The Sacraments. The Church as a Means of Salvation. Text-book, *Wilmer's Handbook of the Christian Religion.*

CIVIL ENGINEERING

I.

DESCRIPTIVE GEOMETRY. In this course are considered problems on the point, right line, and plane; single curved, double curved, and warped surfaces; problems relating to tangent planes, to single curved, double curved, and warped surfaces; intersection of surfaces; spherical projections; orthographic, stereographic, globular, cylindrical, and conic projections; construction of maps, shades and shadows; linear perspective; isometric projections; theory and plates. Numerous practical problems and exercises requiring the application of the principles of Descriptive Geometry, are added by the instructor. Text-book, *Church.*

[Three hours a week for two terms.]

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II.

SURVEYING. This course comprises the whole theory of land surveying and leveling; the use and adjustment of the transit, compass, level, and plane table; methods of measuring; relocations of boundaries; supplying omissions; obstacles to measurement; computations; field notes and plots; laying out land; parting off land; dividing up land; public lands survey. Text-book, *Gillespie.*

[Five hours a week for one term.]

III.

SURVEYING. Field practice and application of theory; adjustment and use of instruments in the field; solution of problems in the field, the theory of which is taught in the class room; practice in keeping field notes; computation and plots.

[Five hours a week for six weeks.]

IV.

HIGHER SURVEYING. This course is a more complete treatment of the theory of Surveying than Course II. and cannot be taken until the completion of that course. It treats of the adjustment, use, and care of all kinds of engineering instruments; problems pertaining to solar attachment; topographical surveying with the transit and stadia; mining surveying; mining claims; survey of mines with shafts and drifts; determining positions of ends of tunnels, and depths below surface; theory of hydrographic and city surveying; geodetic surveying and leveling; measuring base lines; adjustments of angles, triangles, and quadrilaterals; latitude and azimuth; time and longitude; changing mean time into sidereal time and sidereal time to mean time. Text-book, *Johnson.*

[Five hours a week for one term.]

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V.

SURVEYING. Exercises in the field in the adjustment and use of engineering instruments; stadia and plane table surveying in the field, leveling; practice in hydrographic surveying.

[Five hours a week for six weeks.]

VI.

RAILROAD SURVEYING. This course comprises all the theory pertaining to reconnoissance and preliminary surveying for a railroad; theory and maximum economy in grades and curves; location of curves by deflection angles and offsets; obstacles to location of curves; special problems in curves; theory of compound curves; turnouts and crossings; curving the rail on curves and elevation of outer rail; easing grades on curves; vertical curves; earthwork and prismoidal formula; theory of excavation and embankment; correction in excavation on curves; cross-section leveling; theory of the transition curve and practical applications. Text-book, *Searle, Crandall.*

[Five hours a week for one term.]

VII.

RAILROAD SURVEYING. Exercises in the field; staking out and running tangents, simple, compound and transition curves; execution on the ground of many problems previously treated theoretically; survey for a short line of railroad, leveling, cross-section work, and setting slope stakes; making profiles and maps; calculating the necessary excavations and embankments and cost of construction; culverts.

VIII.

ANALYTIC MECHANICS. The aim of this course is to prepare students of engineering for the study of the

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courses of applied mechanics. The course comprises a study of the fundamental principles of statics, kinematics, and kinetics. The subjects selected are studied with the object of thoroughly preparing the engineering students to pursue the technical and practical branches of their respective courses. Some of the topics considered in this course are: work, energy, conservation of energy; power, composition and resolution of forces, center of gravity, center of mass, moment of inertia, acceleration, dynamics of rigid bodies, laws of friction, etc. Text-book, *Ziwet.*

(*Required of students in Civil, Electrical and Mechanical Engineering.*)

[Five hours a week for first term. Two hours a week for second term.]

IX.

GEODESY. This is an elementary course prescribed for Civil Engineering students in the Junior year, and comprises a study of the instruments and methods of observation, base measurements and field work of the triangulation; methods of least squares, elementary course; calculation of the triangulation, and theory of probable errors; geodetic latitudes, longitudes, and azimuths. This is followed by a brief discussion of the figure of the earth. Text-book, *Merriman.*

[Four hours a week for one term.]

X.

MECHANICS OF MATERIALS. This course is intended to meet the requirements of engineering students, and to prepare them, by a study of the action and effect of forces on beams and structures, to design economically and intelligently the parts entering into a complete structure. The course comprises a study of the elastic and ultimate strength and ultimate deformation of the

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materials of engineering, their properties and methods of testing, and discussion of cases of simple stresses. The general theory of beams including cases of simple and cantilever beams, overhanging, fixed, and continuous beams, is thoroughly investigated. Columns are examined according to Euler's, Rankine's, and other formulae, and results compared. Some of the other subjects considered in this course, are torsion of shafts, the transmission of power by shafts, apparent combined stresses, such as flexure and compression, flexure and torsion, etc. Compound columns and beams, reinforced concrete beams, plate girders and other forms. Then is studied the subjects, resilience and work, impact and fatigue, true internal stresses, centrifugal tension and flexure, unsymmetric loads on beams,—the course closing with a study of the mathematical theory of elasticity. Textbook, *Merriman.*

(*Required of students in Civil, Electrical and Mechanical Engineering.*)

[Three hours a week for one term.]

XI.

ROADS AND PAVEMENTS. This course is intended to familiarize the student with the practical details of laying out and constructing highways, the method of drainage, grading, and most suitable road covering, the improvement of streets in cities and materials used for paving and covering. The manner of preparing the street before paving is placed in position is fully considered and illustrated. The course includes a thorough discussion of the theory of pavements and a description of the various materials used, such as cobble and stone-block, asphalt, brick, wood and broken stone pavements. The method of preparing plans and specifications for the various conditions arising are considered and original

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plans are prepared by students. Attention is also given to the construction of street-car tracks in paved streets. Text-book, *Baker.*

[Four hours a week for one term.]

XII.

ENGINEERING. This course is taken by students of Civil Engineering in the Senior year and teaches the best approved methods of constructing engineering works and the styles of structures suitable for different localities. The study is quite comprehensive including the general theory of the arch and application to the voussoir arch; the theory of earth pressure, and the design of retaining walls; foundations suitable for structures of various classes in connection with which the student becomes acquainted, not only with the methods for ascertaining the bearing power of the foundation, but also the means for constructing deep foundations. The methods for tunnel construction, sewer construction, irrigating canals, river improvements, are included in the course and given by text-book and lectures. The part pertaining to masonry construction includes a study of the properties of stone, brick, mortar, the manner of testing foundations under water, the crib and open caison process, the pneumatic process, the theory of masonry arches and design, arch centers, selection of site for bridge piers and arrangement of spans, the details of construction of bridge piers and manner of location, specifications for masonry, etc. Text-books, *Howe, Patton, Baker, Rankin.*

[Five hours a week for two terms.]

XIII.

SANITARY ENGINEERING. This course is a study of the principles and methods of drainage and disposal of sewage in populous districts; shape, material and cal-

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culation of sewers; catchbasins, flushing and ventilation; separate and combined systems compared; pollution of rivers; chemical precipitation; results and costs of purification; general municipal and domestic sanitation; inspection of neighboring works. Text-book, *Staley and Pierson.*

[Two hours a week for two terms.]

XIV.

BRIDGES AND ROOFS. This course comprises a study of the different systems of trussed bridges and roof trusses, and the calculation of the strains produced when loaded in any manner, the weight of the structure and the effect of wind included. Both graphical and analytical methods are used. Besides the various systems of trussed bridges, which are studied in detail, the plate girders, suspension bridges, cantilever bridges, draw bridges, and roofs of various designs are given equal attention; the purpose being to familiarize the student with the different forms and enable him to design and to estimate the cost of construction. Text-book, *Merriman.*

[Five hours a week for one term.]

XV.

GRAPHIC STATICS. This course teaches the determina of stresses in framed structures by the graphical method. Shearing forces, bending moments, centers of gravity, and moments of inertia are graphically determined by the application of the principles of the force and equilibrium polygons; also the determination of stresses in bridge trusses with parallel chords and with broken chords, caused by uniform loads and locomotive-wheel loads; graphical determination of stresses in roof trusses, graphical treatment of the arch symmetrical and unsymmetrical cases, graphical methods of arch-ribs of hinged ends, and of fixed ends; stress diagrams; tem-

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perature stresses; braced arches; graphics applied to continuous girders. This course is supplemented by full explanations, notes, examples, and problems. Text-book, *Merriman.*

[Five hours a week for one term.]

XVI.

HYDROMECHANICS. This course is a thorough study of the theory of hydrostatics, hydraulics, and hydrodynamics, to which are added many practical exercises. The subjects submitted are the transmission of pressures, center of pressures; velocity of flow from orifices of various shapes; fluid friction; Bernaulli's theorem with friction; Chezy's formula; Kutter's formula; flow over weirs, and through tubes; flow in pipes; loss of head in friction and other losses; flow in conduits, canals, and rivers; velocities in cross sections; methods of gauging the flow, measurement of water power, dynamic pressure of flowing water; designing of waterworks and standpipes; hydraulic motors and relative merits; discussion of water wheels of different types, and a study of the conditions determining high efficiencies; classification of turbines, and a complete study and discussion of the different forms. Text-book, *Merriman.*

[Three hours a week for two terms.]

DRAWING, ARTISTIC

In this department the aim is to lay a thorough foundation in drawing for those who wish to make Art a profession, but the courses are so arranged as to be accessible to other students. The system of teaching, which is that followed in the best art schools, is intended to develop the individuality of each sutdent, so that with a good understanding of the principles of art he may interpret nature according to his own temperament.

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The work is done altogether from cast, object and nature. The immediate surroundings of the University buildings, the lakes and the Saint Joseph River offer many beautiful subjects for the study of landscapes, and the classes are taken out in the summer for this study.

To the old collection of casts has been added a new one which was carefully selected at the National School of Fine Arts in Paris, where all the casts are moulded directly from the originals. The collection is as follows:

FULL FIGURE. The Diadumenos (British Museum); the Doryphoros (Naples). These two figures are full size.

The following figures are reduced mathematically: the Discobolus; the Venus of Milo; the Slave of Michel Angelo; the Achilles; the Fighting Gladiator (Louvre); and Houdon's Anatomical Figure.

BUSTS AND HEADS. Asiaticus (Paris); Brutus (Rome, the Capitol); Cato (Rome, the Vatican); Cicero (Rome, the Capitol); Dante (Florence, Uffizi); Agrippa (Louvre); Venus (Vatican); Centurion (Naples); Ariadne (the Capitol); Psyche of Naples (Naples); Vestal (Vatican); Niobe (Vatican); the Two Daughters of Niobe (Florence).

Among the old busts are the Apollo Belvidere, the Antinous, Bacchus, Juno, Mercury, Demosthenes, etc.

Besides there is a complete set of decorative and architectural ornaments, taken from monuments of antiquity, the Middle Ages and the Renaissance, and of elements of the human figure (hands, feet, etc.) from the antique, and some anatomical pieces.

ELEMENTARY CLASS

I.

(*a*) Drawing from casts of ornaments purely geometrical, such as moldings, ovoloes, dentils, etc. Sketching from simple objects.

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(*b*) Drawing from casts of ornaments of which the elements are living forms, such as ornamental leaves and flowers. Sketching from nature, leaves and flowers.

(*c*) Drawing from architectural elements, such as pedestals, bases, shafts, cornices, etc. Lectures on perspective, direction of the principal lines in relation to the horizon. Elementary notions of the five orders of architecture.

(*d*) Drawing from casts of the human figure: hands, feet, masks, etc. Architectural ornaments. Sketching from familiar objects.

ANTIQUE CLASS

II.

(*a*) Drawing from the antique of heads and busts. Still life drawing. Sketches of landscapes from nature. Selection of a subject. Composition in landscape. Applications of perspective.

(*b*) Drawing from the antique, full figure. Occasional studies of the head from the living model. Sketching from the costumed model. Still life in water colors. History of Art.

III.

LIFE CLASS. Drawing from life. Artistic anatomy. Anatomical studies from the collections of Science Hall. Still life painting in water colors and oil. Landscape painting. Drawing for illustration.

IV.

SKETCH CLASS. One hour a week. The students have themselves an organization, "The Crayon Club," the object of which is to sketch college scenes and to do illustrative work; these sketches are brought into class and criticised.

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V.

MODELLING. One entire week in the spring terms of the Sophomore, Junior and Senior years in Architecture is devoted to modelling in clay. The objects modelled are architectural forms, copied from the cast or made from the student's drawings of his own work, as his progress and ability may warrant.

VI.

CLASS OF DECORATIVE DESIGN. The object of this department is to prepare students for professional work in decorative designings of all kinds. They will take up the study of historical ornaments and will be taught the several principles of the arrangement of designs, and from personal sketches of plants and flowers will be shown the art of making original designs for wall paper, book covers, stained glass, carpets, interior decorations, metal plates, etc. No particular program is given out as the teaching is purely individual.

DRAWING, MECHANICAL.

The instruction begins with sketching from blocks, of various geometric forms, so that the hand and eye may be trained in outline drawing in pencil and pen. Then follows the study of light and shade.

After considerable practice, and when a thorough knowledge of freehand drawing has been acquired, the use of instruments is taken up. Beginning with the instruments, attention is given to accurate draughtsmanship upon plates, illustrating problems of Civil, Electrical, Mechanical and Architectural Engineering. This work is continued throughout the courses.

[*Two hours of actual time in drawing are required for each credit hour on the schedule.*]

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I.

FREEHAND. This course consists of sketching with pencil and pen from flat copies and models of machine parts, and freehand lettering. Later in the term, the use of instruments, section-lining and lettering are taught. Text-book, *Jamison's Elements.*

[Three hours a week for one term.]

II.

PROJECTION DRAWING. The course embraces the principles of projection, methods of shop-drawing, tinting, tracing, blueprinting, line-shading and the preparation of working drawings of complete machines. This course must be preceded by Course I. Text-book, *Jamison's Manual.*

[Three hours a week for one term.]

III.

DESCRIPTIVE GEOMETRY. A series of accurate plates is made, illustrating the principles of orthographic and spherical projections, shades and shadows, perspective and isometric projections. (*Students in Architecture are required to do advanced work in shades and shadows and perspective.*

[Four hours a week for two terms.]

IV.

KINEMATIC DRAWING. Designing of cams and gear teeth, complete working drawings of machines involving the application of kinematics and the computation of dimensions.

[Two hours a week for two terms.]

V.

TOPOGRAPHY. Pen and colored topographical drawing, conventional signs, map drawing from notes taken

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from surveys. This course must be preceded by Course I. Text-book, *Reed.*

VI.

STEREOTOMY. This course comprises a study of the application of the principles of Descriptive Geometry to the determination of the forms and sizes of the stones used in the construction of the different classes of arches and masonry structures. This course is given by lectures in the drawing room, explaining the construction of templates, and the use of directing instrument; also explanations of methods of drawing plans, elevation and development of oblique arches, wing walls and the like. A certain number of plates and drawings is required, illustrating the methods of performing practical work.

Drawing and designing plans, elevations and sections of masonry construction, foundations, dams, piers, abutments, culverts and arches. Text-book, *French.*

[Three hours a week for one term.]

VII.

BRIDGE DESIGNING. This course proceeds from simple framed girders to complete bridge-trusses of various designs, — required of Juniors in Civil Engineering. Complete design of a railroad bridge and detail drawings, —a short general course of bridge designing for Seniors.

[Three hours a week for two terms.]

VIII.

MACHINE DRAWING. A continuation of Course I. and II. embracing advanced work in machine drawing and the elementary principles of mechanical design with calculation of dimensions and construction of drawings from sketch-book notes. Text-book, *Low's Machine Drawing and Design.*

[Three hours a week for two terms.]

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IX.

FREEHAND. The principles of freehand drawing in pencil and pen from objects, and later from biological specimens, plants, animals and microscopical preparations.

[Two hours a week for two terms.]

X.

FREEHAND. Advanced drawing from plants and anatomical dissections of animals. Illustrations for publications.

[Two hours a week for two terms.]

XI.

WATER COLOR. Drawing in water color from still life and nature.

[One hour a week for one term.]

XII.

RENDERING IN WATER COLOR. The rendering of architectural drawings, including perspectives,—casting of shadows, color treatments of buildings, and handling of foreground and background.

[One hour a week for one term.]

XIII.

PEN AND INK. Rendering drawings in pen and ink from studies by noted artists in this branch of art; followed by rendering of original drawings.

[One hour a week for one term.]

ELECTRICAL ENGINEERING

I.

APPLIED ELECTRICITY. A course of lectures and recitations, supplemented by laboratory practice, on the general theory of electricity and magnetism and its

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application to practical work, as follows: Setting up and testing primary and secondary batteries, systems of call bells, electric and gas lighting appliances, fire and burglar alarms, telegraph and telephone lines, switch boards and accessories. Experiments with induction coils, magnets, switches, voltmeters, ammeters, wheatstone bridges, galvanometers and other measuring instruments. The study of direct current generators and motors, arc and incandescent lighting systems, street railway machinery and appliances, electric heating and forging, electrolytic processes, etc. Text-book, *Swoope's Practical Electricity.*

(*Students in Architecture spend one term in this course.*)

[Five hours a week for two terms.]

II.

APPLIED ELECTRICITY. Lectures and laboratory work on the construction and testing of switches, magnets, measuring instruments, induction coils, etc. The calculation of sizes of wire and location of circuits for lighting and power, the experimental study of alternating current machinery and accessories.

If the student has acquired sufficient skill in handling tools in his workshop, he may design and build a small dynamo, starting with rough castings, doing all the fitting and finishing, winding and adjusting, and finally testing for insulation, efficiency, and adaptability to special purposes. This course must be preceded by Course I (*Courses I. and II. are required in the Short Program Electrical Engineering; they are elective for general students and those studying telegraphy.*)

[Five hours a week for two terms.]

III.

DYNAMO-ELECTRIC MACHINERY. Recitations on the physical theory of dynamo machines, armature actions

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and reactions, characteristic curves, mechanical points, theory of armature winding, the mathematical theory of alternating currents, phase relations, modern forms of single phase and multiphase generators and motors, design of transformers. Text-books, *Sheldon's Dynamo Electric Machines, Sheldon and Mason's Alternating Currents.*

[Five hours a week for two terms.]

IV.

ELECTRICAL LABORATORY. Practical work at wiring buildings for lights and power, testing circuits for insulation and grounds, construction and operation of storage batteries, management and care of dynamos, characteristic curves of particular machines under different conditions, efficiency tests of motors by absorption dynamometer methods, alternating current dynamo and transformer tests, the testing of storage batteries, and complete plant efficiency tests. Careful notes are taken.

[Five hours a week for two terms.]

V.

DESIGNING. The designing and making of working drawings of switches, resistance, and other electrical apparatus. Calculation of sizes of wire and location of circuits for lighting buildings. Complete drawings of direct and alternating current dynamos. Laying out plants for power and lighting.

[Three hours a week for two terms.]

ELOCUTION AND ORATORY

I.

READINGS AND DECLAMATIONS. This course is designed to correct defects in pronunciation and emphasis. Each student is required to give two declamations.

[One hour a week for one term.]

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II.

READINGS AND DECLAMATIONS. Continuation of Course I. Each student is required to give three declamations.

[One hour a week for one term.]

III.

PRACTICAL ELOCUTION. Exercises in breathing, voice culture, and action. The principles of pronunciation and emphasis and their application in the reading of selections. Text-book, *Fulton and Trueblood's Practical Elocution.*

[One hour a week for one term.]

IV.

PRACTICAL ELOCUTION. Further exercises in breathing, voice culture, action. Quality, force, pitch and time. Minute speeches and declamations. Lectures on the principles of action. Text-book, *Fulton and Trueblood's Practical Elocution.*

[One hour a week for one term.]

V.

ORAL DISCUSSIONS. The application of formal logic to debating. Analysis of selected argumentative speeches, and the preparation of briefs. Courses III. and IV. and a course in logic are required for admission to this course. Sections are limited to twenty-four students.

[One hour a week for one term.]

VI.

SHAKESPERIAN READING. The critical and artistic reading of two of Shakespeare's plays accompanied with stage action. The students present the play by scenes before the class. Courses III. and IV. are required for admission to this course. Sections are limited to twenty-four students. This course alternates with Course VII. described below.

[One hour a week for one term.]

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VII.

ORATORY. A study of the great orators of ancient and modern times. Each student is required to write and deliver a biographical oration on one of the great orators. Lectures on methods of public address. Courses III. and IV. above, and Course I. in English are required for admission to this course. Sections are limited to twenty-four students. This course alternates with Course VI. described above.

[One hour a week for one term.]

VIII.

ASSEMBLY WORK. This course is designed to supplement the other courses in this department. It consists of debates, short orations, minute speeches, declamations, impromptu and drill work in parliamentary law.

[One hour a week for six terms.]

ENGLISH

I.

(*a*) PROSE FORMS. Special treatment of Exposition and Argumentation. *Genung's Working Principles of Rhetoric, Part II.* Frequent practice in writing essays.

[Two hours a week for one term.]

(*b*) *Heydrick's How to Study Literature,* with practical exercises in analysis of literary forms.

[One hour a week for one term.]

(*c*) LITERATURE. *Higginson and Boynton's.* In In this course the student acquires a good knowledge of the contents of American literature. The biography of men of letters is also a part of this course.

[One hour a week for two terms.]

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(*d*) LYRIC POETRY. The technique is carefully laid down and choice specimens of lyric poetry are read critically in class. There is much required reading and writing.

[One hour a week for one term.]

II.

(*a*) PROSE FORMS. Special study of the Novel and the Short Story. The development of the novel is carefully studied, and its kinship with other forms of narrative is pointed out. Frequent practice in writing.

[Two hours a week for one term.]

(*b*) LITERATURE. The development of English literature is studied, minute attention being given to great periods.

[One hour a week for two terms.]

(*c*) THE SONNET. Technique and analysis of famous sonnets.

[One hour a week for one term.]

III.

(*a*) PROSE FORMS. Intensive study of the Essay and the Oration. Each student in this course is required to read the great essays and orations in English literature. He must produce four essays and two orations during the term.

[Two hours a week for one term.]

(*b*) LITERATURE. Recent English and American Poetry. This course deals not only with the best work done in recent volumes of collected verse, but also takes account of the best fugitive pieces in the magazines.

[Two hours a week for one term.]

(*c*) DIDACTIC POETRY AND SATIRE. This course involves reading chiefly.

[One hour a week for two terms.]

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IV.

(*a*) THE LAWS OF THE EPIC AND THE DRAMA. *Ker's* treatise on the Epic with required readings in narrative poetry. *Freytag's Technique of the Drama,* with supplementary notes.

[Two hours a week for one term.]

(*b*) SHAKESPEARE. Reading and Analysis of Plays.

[Two hours a week for one term.]

(*c*). THE LEADING POETS OF THE NINETEENTH CENTURY. Analytical study and required reading.

[One hour a week for two terms.]

V.

GRADUATE WORK IN ENGLISH. Students wishing to do advanced work in English will be provided with library facilities and led through the usual work for the degree of Master of Letters or Doctor of Philosophy.

The major subject on approval of the Faculty of English may be any special aspect of a literary form or epoch, or a comparative study of related authors.

Seminar work, the study of texts, and special lectures by professors make up the course.

GEOLOGY

I.

MINERALOGY. Lectures, recitations, and laboratory work. A study of crystallography and the classification of minerals, accompanied by practice in the laboratory and museum in the determination of minerals, especially the ores. Blow-pipe analysis. Text-book, *Crosby.*

[Two hours a week for one term.]

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II.

ASSAYING. Chiefly laboratory work. Furnace assaying of the ores of gold, silver and lead. Text-book, *Ricketts.*

[Two laboratory hours a week for one term.]

III.

GEOLOGY. Lectures, recitations, demonstrations. The study of the general features of the earth; the material composing the accessible parts of the earth; the arrangements of the material in rocks; the causes of geological changes; the history of the earth and the various forms of life that existed in the different periods of successive geological ages. Text-book, *Brigham.*

[Four hours a week for one term.]

GERMAN

I.

Grammar, *Bacon.* Translation from German into English of simple prose; translation of English exercises into German. Reading of short stories and selections from more difficult prose.

German Reader, *Miller and Wenkelbach.*

[Five hours a week for two terms.]

II.

Grammar, *Bacon.* Translation into German of narrative prose and selections from history. Sight reading of selections from history.

Hermann and Dorothea, *Goethe;* Lichtenstein, *Hauff.*

[Five hours a week for two terms.]

III.

Grammar, *Bacon.* Sight reading of plays, poems and prose writing. Translation of selections from history

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and literature; original essays.

Minna von Barnhelm (*Lessing*); Best known poems, (*Heine*); Corsespondence (*Schiller-Goethe.*)

[Four hours a week for two terms.]

GREEK

I.

LYSIAS. Orations selected. Short history of the Attic orators.

HOMER. Odyssey.

Prose Composition based on Lysias.

Epitome of the New Testament: Parts IV., V. *Stoffel.*

[Four hours a week for one term.]

II.

LYSIAS. Orations selected.

HOMER. Odyssey.

Prose Composition based on Lysias.

ST. JOHN CHRYSOSTOM. Eutropius.

[Four hours a week for one term.]

III.

HERODOTUS. Selections. Study of Herodotus' dialect.

Advanced Greek Prose Composition.

ST. BASIL. De Frofanis Scriptoribus.

[Four hours a week for one term.]

IV.

HERODOTUS. Selections.

Selection from the Greek Lyric Poets.

Advanced Greek Prose Composition.

ST. GREGORY. Machabees.

[Four hours a week for one term.]

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V.

DEMOSTHENES. The Speech on the Crown, or the Olynthiacs and the Philippics. Review of the political situations at Athens and events bearing upon the orations.

THUCYDIDES. Book I. Greece before the Peloponnesian War. Importance of this war in Greek history. The speeches will form the subjects for special class interpretations. Stylistic differences between pure Attic and archaic will be pointed out.

During this course special attention will be given to textual and exegetical criticism, practically shown by passages selected for that purpose. This is done in the belief that it is the best way to make students appreciate the notes in school editions of classical authors.

PRACTICAL EXERCISES—Embodying idiomatic expressions of the authors read.

[Four hours a week for one term.]

VI.

AESCHYLUS. One play to vary each year. In connection with it will be discussed the origin of the drama, the part of the chorus in the early tragedy and the religious tenets of Aeschylus. The structure of a Greek tragedy, the iambic trimeter and the lyric meters will be sufficiently explained so as to be properly appreciated by the students. Incidentally also the Greek festivals, at which the plays were staged, and the Dionysiac theater will be discussed.

SOPHOCLES. Oedipus Tyrannus and Antigone. Digest of the Theban legends. Religious views of Sophocles compared with those of Aeschylus.

ELEMENTS OF GREEK LITERATURE. Students shall use *Jebb's Primer of Greek Literature.*

[Four hours a week for one term.]

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VII.

EURIPIDES. One play, to vary each year. Religious tendencies of Euripides, His style as compared with that of Aeschylus and Sophocles. Dramatic art, and his right to the title of "Scenic Philosopher."

ARISTOPHANES. One play, selected from the following list: The Acharnians, the Knights, the Frogs, the Clouds, the Birds, or the Wasps. In connection with the reading of these plays will be treated the Greek comedy, —its origin, nature, and aim. Aristophanes, the great burlesque critic of Athenian life and manners. The structure of a comedy compared with that of a tragedy.

PRACTICAL EXERCISES in Greek composition.

[Four hours a week for one term.]

VIII.

PINDAR. Selected Odes, in connection with which the public games will be studied. *Elective.*

GREEK FATHERS. St. Basil. The Martyr Gordius. St. John Chrysostom. The Return of Bishop Flavian. St. Gregory Nazianzen. Funeral Oration of Caesarius. *Elective.*

PLATO. Apology and Crito. Socrates—his friends and enemies. Athenian court proceedings.

[Four hours a week for one term.]

IX.

GRADUATE WORK IN GREEK. Advanced courses of instruction in the Greek language and literature will be provided for graduate students who look forward to the Master's or Doctor's degree. The center of work will be the Greek seminar, devoted to the interpretation of passages selected for that purpose by the director of the seminar, and to a critical study of one particular author or of a group of authors in the same department of Greek literature; as for instance, Homer, Plato or the orators, the historians, the dramatists, etc.

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The work of the seminar will be supplemented by lectures on the history of comparative philology, on comparative grammar, and on the Greek dialects.

For those who desire a broader basis for their linguistic studies, an elementary course in Sanskrit will be offered.

HISTORY

ANCIENT HISTORY

I.

(*a*) ANCIENT GREECE to the conquest by Rome of the Hellenic world. Readings and examinations on required texts. This course is given in alternate years with Course I.

[Four hours a week for two terms.]

(*b*) ANCIENT ROME to the barbarian invasions. Readings, and examinations of required texts. This course is given in alternate years with Course I. (*a*).

In both courses, the student is required to become familiar with the institutions of the ancient world, and to study the same in *De Coulanges' The Ancient City.*

[Four hours a week for two terms.]

MEDIEVAL AND MODERN HISTORY

II.

(*a*) THE HISTORY OF THE MIDDLE AGES from the invasion of the barbarians, and the history of the periods of the Renaissance and the Reformation of 1603. Readings, and examinations on required texts.

(Three hours a week for two terms.)

(*b*) THE GENERAL HISTORY OF EUROPE from the beginning of the seventeenth century to the present time. Readings, and examinations on required texts.

[Four hours a week for one term.]

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III.

THE HISTORY OF THE BRITISH ISLES TO THE REVOLUTION IN 1689. For the narrative *Gardiner's Students' History* is used as a text and is supplemented by lectures. In the study of the development of political institutions *Feilden's Constitutional History* is used. In addition, students shall make free use of the library in preparing special topics upon which they shall report orally in class.

[Four hours a week for two terms.]

AMERICAN HISTORY

IV.

(*a*) AMERICAN HISTORY FROM ITS BEGINNING TO 1763. A large part of the work of this and the following course consists in the preparation and presentation in class of special topics by the students. An effort will be made to train the student in the use of original sources as well as in the discriminating use of secondary works. Weekly written tests are given upon the lectures and the assigned collateral reading.

[Four hours a week for one term.]

(*b*) AMERICAN HISTORY FROM 1763 TO THE PRESENT TIME. Treatment as in (*a*) above. Also a book review, a bibliographical report and a biographical essay by each student.

[Three hours a week for two terms.]

V.

RESEARCH WORK IN HISTORY. Facilities are offered to graduate students who wish to do advanced work in history leading to the Master's or the Doctor's degree. Evidence to begin specializing must be given by candidates who have received their Bachelor's degree at another College. The work is directed in the seminar and is supplemented by lectures.

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LATIN

I.

LIVY. Selections. Study of Livy's grammar and style.

CICERO. Epistles selected.

VERGIL. Aeneid.

PROSE COMPOSITION. Frequent practice in writing.

[Four hours a week for one term.]

II.

LIVY. Selections.

CICERO. De Senectute and DeAmicitia.

PLINY. Epistles selected.

PROSE COMPOSITION. Frequent writing of continuous prose.

[Four hours a week for one term.]

III.

CICERO. De Oratore. Book I.

HORACE. Odes and Epodes. Study of metrical systems; peculiarities of styles; plan of composition; comparison with Odes of a similar nature.

ADVANCED PROSE COMPOSITION. Frequent practice in writing.

[Four hours a week for one term.]

IV.

TACITUS. Dialogus De Oratoribus.

HORACE. Odes and Epodes; or, Satires selected. See Course III.

TERENCE. Phormio. Short history of Greek and Roman comedy.

ADVANCED PROSE COMPOSITION. Frequent practice in writing.

[Four hours a week for one term.]

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V.

LIVY. Roman History, First Book. In the reading of the text particular attention is called to the rules of syntax—roots and derivation of words—and the ancient history, geology and mythology.

LATIN COMPOSITION twice a week, either paraphrases or original. Short fables and stories.

HORACE. Epistola ad Pisones translated, analyzed and criticised from a philological and literary standpoint.

ANCIENT LITERATURE. Historians and Lyric Poets: their lives, their works, their genius.

[Four hours a week for one term.]

VI.

TACITUS. Agricola and Germania. While reading the text a comparison is made with the private and public manners of modern nations.

TERENCE. Andria. Sight reading.

HORACE. The Literary Epistles.

Weekly practise in written composition, Latin conversation and versification.

ANCIENT LITERATURE. Dramatists of Greece and Rome compared and discussed.

[Four hours a week for one term.]

VII.

QUINTILIAN. De Institutione Oratoria, Books Tenth and Twelfth. Translation. The explanation embraces a literary criticism of Grecian and Roman orators, and practical remarks on Latin idioms and the fine arts of antiquity.

Short orations or dissertations, and practical conversations take place weekly.

PLAUTUS. Captivi. The study of the play gives a full knowledge of the characters, the plot, the style, the archaic forms and the construction peculiar to the author.

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ANCIENT LITERATURE. Orators, especially Demosthenes and Cicero.

[Four hours a week for one term.]

VIII.

CICERO. De Officiis. Partly sight reading. Besides the study of the work from a philological standpoint, the student is made acquainted with the main systems of Grecian philosophy, and continual reference is made to Course III. in philosophy.

Oratorical and philosophical compositions alternate weekly. Latin conversations on general topics.

LUCRETIUS. De Rerum Natura. Select passages. Synopsis of the poem. Statement and refutation of erroneous philosophical systems of antiquity. Analogy with the errors of our day. Style of the writer.

ANCIENT LITERATURE. Philosophers, particularly Socrates, Plato, Aristotle, Cicero and Seneca.

[Four hours a week for one term.]

IX.

GRADUATE WORK IN LATIN. Advanced courses of instruction in the Latin language and literature will be provided for graduate students who are candidates for the degree of Master or Doctor. The work will be directed in the seminar and be devoted to a critical study of one particular author or group of authors.

The work of the seminar will be supplemented by lectures on comparative philology and comparative grammar.

MATHEMATICS

I.

ALGEBRA. This course includes a study of the binomial theorem, the theory of logarithms, choice,

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chance, variables and limits, series, determinants. Then follows a thorough study of the general properties and solution of equations, embracing the subjects of derivatives, transformation, detached coefficients, surd and imaginary roots, incommensurable roots, limits of roots, biquadratic equations, Des Cartes' and Cardan's rules; Sturm's theorem; Horner's method. Text-book, *Wentworth.*

[Five hours a week for one term.]

II.

ANALYTIC GEOMETRY. This course includes a study of the point and right line; conic sections; their equations and properties; discussion of the general equation of the second degree containing two variables; different systems of coordinates; transformation of coordinates; an elementary course in geometry of three dimensions, embracing the point, straight line, plane, and surfaces of revolution; transformation of coordinates; quadric surfaces and supplementary propositions. Text-book, *Bailey and Woods.*

[Five hours a week for one term.]

III.

CALCULUS, DIFFERENTIAL. This course as also Courses IV. and V. is designed to meet the requirements of Engineering students. It includes a study of the methods for the differentiation of algebraic, logarithmic and exponential, trigonometric, and inverse trigonometric functions, successive differentiation, and differential coefficients; treatment of implicit and compound functions; expansion of functions; indeterminate forms; partial differential coefficients of the first order and of higher orders; direction of curvature; radius of curvature;

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envelopes; maxima and minima of functions of one independent variable, and of several independent variables; tracing curves; differentials of arcs, plane areas surfaces and volumes of revolution. Text-book, *Osborne.*

[Five hours a week for one term.]

IV.

CALCULUS, INTEGRAL. Integration of elementary forms and of rational fractions; integration by rationalization and by parts; successive integration; multiple integrals; definite integrals, limits of integration; double integration applied to plane areas; rectification of plane curves; quadratures of plane areas and surfaces of revolution; surface and volume of any solid; intrinsic equation of a curve. This course is supplemented by numerous exercises and examples. Text-book, *Osborne.*

[Five hours a week for three months.]

V.

DIFFERENTIAL EQUATIONS. An elementary course for Engineering students, supplementary to the course of integral calculus. It embraces equations of the first order and first degree; equations of the first order, but not of the first degree; singular solutions; linear equations with constant coefficients; special forms of equations with higher orders. Numerous applications to mechanics and physics are introduced during the course. Text-book, *Murray.*

[Five hours a week for six weeks.]

VI.

ADVANCED WORK. The prescribed courses in pure mathematics are I. to V. inclusive. The following advanced courses are offered, based on standard authors. The text-books are not necessarily the same every year. The number of students required to constitute a class in any one subject must be at least five.

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(*a*) Higher Algebra, *Hall and Knight, Smith, Crystal.* (*b*) Advanced work in Trigonometry, *Todhunter, Lock.* (*c*) Determinants, *Peck, Hanus, Muir.* (*d*) Theory of Equations, *Burnside and Panton.* (*e*) Advanced Calculus, *Beyerly, Todhunter, Williamson.* (*f*) Advanced Analytic Geometry, *Salmon.* (*g*) Analytic Geometry of Three Dimensions, *Aldis, Frost, Salmon.* (*h*) Quaternions, *Hardy* with *Kelland* and *Tait* as reference.

[Three hours' recitation a week for one subject.]

MECHANICAL ENGINEERING.

I.

THERMODYNAMICS. The subject begins with a theoretical study of the steam engine, gas engine and other heat motors involving the laws of thermodynamics of gases, saturated vapors and superheated steam. The applications of this preliminary work are then dwelt upon, and prime movers, the injector, condensers, refrigerating machinery, boilers and pumps are studied in detail. During the second term a study of the difficult types of internal combustion engines is made together with a general study of casts in operating power plants. Frequent reference is made to trade catalogues, of which an abundant supply should be obtained by the student. Text-book, *The Steam Engine,* by *Holmes.*

[Four hours a week for two terms.]

II.

MATERIALS OF ENGINEERING. This course, supplemented by shop work and laboratory work in testing materials of construction, is designed for the purpose of acquainting the student with the properties of the material he will use in his profession. Tensile and shearing strength, elasticity and resistance are studied, together with the effects of strain, intermittent loading and

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impact. The process of manufacture of the most important materials is taken up, and estimates of the cost of construction at market prices complete the work. Text-book, *Thurston's Materials of Engineering.*

[Two hours a week for one term.]

III.

STEAM ENGINE DESIGN. In this course the forms and sizes of steam engines, computation of dimensions and advantages and adaptation of special forms of engines for specific work are taken up, giving the student a thorough knowledge of constructive detail. The latest researches and contemporary practice may be consulted in the numerous publications found in the University Library. During the first term of the Senior year is required the complete design with working drawings of a simple non-condensing steam engine for specific purpose. The second term is given to designing a multiple expansion, jacketed, condensing engine for marine service. The text-book used is *Whitham's Steam Engine Design.*

[Five hours a week for two terms.]

IV.

STEAM BOILERS. This subject is treated much as that of Course III. The determination of sizes of parts from considerations of strains, thickness of shells, size of rivets, braces, furnaces and proper methods of connection of boilers, with efficiency of furnaces and life of boiler, are some of the subjects considered. The method of determining the efficiency of fuels, heating surface, heights of chimneys, boiler settings and materials used in connection are also discussed. Text-book, *Steam Boilers* by *Munro.*

[Three hours a week for one term.]

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V.

KINEMATICS. This course treats of the geometry of machinery, the determination of the paths of the various parts of an elementary combination and the constraining of the parts to move in these paths. The general theory is then applied to cams and gear teeth, the relative motion of machine parts and kinematic trains, belts, pulleys, speed cones, link work and other aggregate combinations. *Barr's Kinematics of Machinery* is the text-book used.

[Three hours recitation and two hours drawing a week for one term.]

VI.

MACHINE DESIGN. This work involves a study of the form and strength of machine parts as applied in designing, with computation of dimensions for fastenings, bearings, rotating pieces, belt and tooth gearing, etc. The derivation of rational formulae and the determination of empirical formulae are included and applied in designing. The text-books used are *Unwin's Elements of Machine Design, Low's Handbook for Mechanical Engineers* and *Reed's Machine Design and Drawing.*

[Three hours a week for one term.]

VII.

VALVE GEARS. This course includes a complete study of the Bilgram diagram as applied to slide valves and the principal automatic cut-off engines. The radical gears, such as Hackworth, Walschaert, Marshall and Joy are treated in the same way, and in conclusion the student is made familiar with the various types of Corliss valves, shifting eccentrics and link motions. The text-book is *Halsey's Valve Gears.*

[Two hours a week for one term.]

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VIII.

MECHANICAL LABORATORY. The work taken up includes a study of the methods of testing the steam engine under varying running conditions, valve setting, calibration of thermometers, gauges and indicator springs, use of Prony brake, Weber and Emerson dynamometers, Pelton water wheel, Weir calibration, etc. Text-book, *Carpenter's Experimental Engineering.*

[Five consecutive hours a week for one term.]

IX.

STEAM ENGINES AND BOILERS. A brief course in the study of boilers and steam engines designed to familiarize the student with the different types in use and their respective merits. Only that theory is taken up which is necessary to the working out of practical problems, the ultimate object of the course.

Students taking this work must provide themselves with an abundant supply of trade catalogues. Text-book, *Power and Power Transmission,* by *Kerr.*

[Three hours a week for one term.]

X.

GAS AND VAPOR ENGINES. This course, extending over two terms, is given to a general descriptive study of all the types of gas engines and explosive motors. The general construction of gas, oil and vapor engines is studied together with their adaptation to various uses. Results due to change in ignition, compression and variation of working fluid; methods of speed regulation and government and the details of auxiliaries as, pumps, carburettors, hot tubes, batteries, spark coils and dynamos are dwelt upon. The text-book used is *Gas, Oil and Vapor Engines,* by *Hiscox.*

[Five hours a week for two terms.]

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XI.

GAS ENGINE DESIGN. A complete study of the thermodynamics and design of the gas engine, by text-book, lectures and drawing board. The major subjects taken up are power, efficiency, economy, forces due to gas pressure and inertia and dimensions of engine parts. *Lücke's Gas Engine Design* is the text-book used.

[Five hours' recitation and ten hours' drawing a week for two terms.]

XII.

GAS ENGINE CONSTRUCTION. The complete working up from rough castings and forgings of a small type of gas engine. This is part of the thesis work for students in the Short Program and requires the complete machining and assembling of the engine and must be preceded by Courses XI. and XII.

[Three hours a week for two terms.]

XIII.

GAS ENGINE LABORATORY. Indicator practice, commercial efficiency, governing, economy, speed regulation. Experiments in ignition, spark coil construction, carburettors and vaporizers. Test of engine constructed by the student.

[Two afternons each week for two terms.]

SHOPWORK.

XIV.

(*a*) WOODWORK. Exercises in planing, splicing framing, scroll sawing and turning.

[Three hours a week for one term.]

(*b*) APPLICATION OF CARPENTRY to pattern making, cores, etc., including parts of machines, pipe joints, cranks and bearings.

[Three hours a week for one term.]

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(*c*) FOUNDRY PRACTICE. Setting up and drawing simple and complicated patterns. Lectures on heating and pouring metals for different purposes. Core making.
[Three hours a week for one term.]

(*d*) IRON FORGING, welding, annealing, shaping, tool making, tempering and case hardening.
[Three hours a week for one term.]

(*e*) BENCHWORK in iron, including surface chipping, key setting, draw filing, scraping and polishing.
[Three hours a week for one term.]

(*f*) ACCURATE WORK on lathe, planer, shafting and milling machines. Construction of machine tools, reamers, taps, twist drills, gear wheels and complete machines.
[Three hours a week for two terms.]

THESIS. Each candidate for a degree in Mechanical Engineering must present for graduation a thesis of considerable magnitude which will exhibit his knowledge of the courses he has followed. It may embrace designing, experimental investigation or original research in a subject selected by the student and approved by the professor. The major part of the second term, Senior year, is devoted to this work, and graduation is conditional upon the knowledge of mechanical engineering displayed in its preparation.

MICROSCOPY

I.

MICROSCOPY. Lectures and laboratory work. Refraction and dispersion of light and illumination. The index of refraction in different media. Different shapes of lenses. Spherical and chromatic aberration. The selection and care of a good microscope. The use of

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accessories for advanced work; immersion and adjustable objectives, camera lucida, sub-stage condenser, polarizer, micrometers, etc. Special work in photo-micrography. Text-book, *Gage*.

[Two hours a week for two terms.]

II.

MICRO-CHEMISTRY. Laboratory work. The preparation of micro-chemical reagents and their application in testing, fixing, hardening, staining, cleaning and mounting tissues and organs.

[One laboratory hour a week for one term.]

MUSIC

FIRST YEAR

I.

VIOLIN. Studies by Wichtl, Ries, Mazas, Kreutzer, Fiorillo. Compositions by Dancla, DeBeriot, Sitt.

II.

PIANOFORTE. Koehler's and Damm's *Piano School*. Studies by Loeschorn, Berens, Czerny, Heller. Sonatinas and easy sonatas by Clementi, Haydn, Reinecke and Mozart. *Jugend Album* and *Kinderscenen* by Schumann.

III.

VOICE PRODUCTION. Tone placing. Diaphragmatic breath-control. Articulation. Text-books, Shakespeare *Art of Singing, Part I.;* Kofler *Art of Breathing; Studies* by Bassini, English songs.

VOCAL SIGHT READING. Elementary Theory of Music. Intervals and ear-training. Choir practice.

IV.

ORGAN. Rink *Organ School*. Eugene Thayer *Studies*. *Light Preludes and Fugues* by Bach.

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SECOND YEAR

I.

VIOLIN. Studies by Rode, Schradieck, Dont. Sonatas and pieces by Tartini, Bach, Beethoven, Mozart.

II.

PIANOFORTE. Studies by Czerny, Heller, Hasert, Lecouppy, Cramer, Krause. Octave studies by Turner. Bach's preludes, fugues and inventions. Sonatas and pieces by Mozart, Haydn, Beethoven, Mendelssohn, Schumann, Schubert.

III.

VOICE PRODUCTION. Advanced breathing exercises. Study of the chest and falsetto registers. Stroke of the glottis. Text-books, Shakespeare's *Art of Singing, Parts II.* and *III.* Studies from Italian operas; French and English songs.

VOCAL SIGHT READING. Phrasing, punctuation and advanced study. Practice in operatic chorus-work.

IV.

ORGAN. Schneider-Warren *Pedal Studies,* Easy sonatas, by Mendelssohn, Merkel, Rheinberger. Preludes fugues by Bach. *Twenty Studies* by Whiting. *Canonic Studies* by Chadwick.

V.

HARMONY. Construction and use of chords. Harmonization of melodies. Harmonizing from figured bass. Text-books, Goetschius *Tone Relations;* Logier's *Harmony.*

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THIRD YEAR

Ib.

VIOLIN. Sonatas by Bach. Studies by Schradieck-Alward, Wieniawski. Concertos and pieces by Spohr, Vieuxtemps, Mendelssohn, Dvorak.

IIb.

PIANAFORTE. *Gradus ad Paranassum,* Clementi-Tausig. *Das Wohl Temperirte Klavier* by Bach. *English and French Suites* by Bach. *Etudes* by Harberbier and Henselt. Sonatas, concertos and pieces by Beethoven, Weber, Mendelssohn, Chopin, Schubert and Grieg.

IIIb.

VOICE PRODUCTION. Study of trill, mordent, gruppetto, etc. *Messa de Voce.*

IVb.

ORGAN. Sonatas, preludes and *Chorale Vorspiele* by Bach. Concert pieces by Handel, Merkel, Salome, Whistling, Best, Rheinberger.

HARMONY. Counterpoint. Simple two and four part counterpoint; double and florid counterpoint. Canon, fugue.

FOURTH YEAR

Ic.

VIOLIN. Studies by Paganini. Concertos and pieces by Beethoven, Brahms, Burch, Joachim and others.

IIc.

PIANOFORTE. Studies by Tausig and Chopin. Sonatas, concertos and concert pieces by Schumann, Brahms, Rubinstein, Liszt.

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IIIc.

ORGAN. The greater preludes, fantasies and fugues of Bach. Sonatas and concert pieces by Thiele, Widor. Dubois, Guilment and Saint-Saens.

IVc.

HARMONY. Composition. Construction of musical forms, *i. e.*, the sonata, rondo, etc. Practical application in an original manner of these forms. Orchestration.

ORCHESTRAL INSTRUMENTS

Instruction is also given on the viola, flute, piccolo, cornet, trombone, guitar and mandolin.

Opportunity is given to the advanced students of playing in the University Orchestra and the University Band.

SINGING CLASS

There is an organization of musical students open only to those taking lessons in vocal music; the Choir and the Glee Club are selected from the members of this class.

PHARMACY

I.

ELEMENTS OF PHARMACY. Lectures and recitations on the art and science of pharmacy, and demonstrations of the various pharmaceutical processes. Text-book, *Remington's Practice of Pharmacy.*

[Three hours a week for two terms.]

II.

GALENICAL PHARMACY. A laboratory course to accompany Course I. This course consists of the prac-

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tical application of the pharmaceutical processes to the manufacture of official preparations of the United States Pharmacopoeia and of unofficial and N. F. preparations.

[Three hours a week for one term.]

III.

INORGANIC PHARMACY. Laboratory, demonstrations and recitations. A thorough course in the preparation and testing of pharmaceutical and technical chemicals.

[Six hours a week for one term.]

IV.

GENERAL PHARMACY. A systematic classification of organic and inorganic drugs and preparations from a pharmaceutical standpoint, followed by a close study of each of the classes.

[Two hours a week for two terms.]

V.

MAGISTRAL PHARMACY. Includes the manifold methods of extemporaneous pharmacy with consideration of incompatibility, posology, and the principles of elegant pharmacy. Dispensing and prescription practice.

[Three hours a week for one term.]

VI.

PHARMACEUTICAL CHEMISTRY. Chiefly assaying, testing and manufacturing. Determination of melting and boiling points, and solubilities. Some attention is given, also, to toilet and commercial preparations with a a view to the invention and development of original formulas.

[Five hours a week for one term.]

VII.

GENERAL PHARMACY. Pharmaceutical analysis and assaying, micro-chemical, polariscopic and spectroscopic

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estimations. Incompatibilities and methods of manufacture. Food analysis.

VIII.

MATERIA MEDICA. This work embraces a detailed consideration of botanical drugs, their pharmaceutical definition and description, constituents, habitat, therapeutic action, use, dose and antidote. Attention is given also to mineral drugs and those of animal origin. They are studied individually at first, then in classes or groups.

[Three hours a week for three terms.]

IX.

PHARMACEUTICAL ARITHMETIC. This work includes a study of weights and measures, percentage relationship of systems, reducing and enlarging formulas, alligation and chemical problems.

[Three hours a week for one term.]

X.

PHARMACOGNOSY. The identification of preparations and crude drugs by their physical properties with special reference to quality and detection of adulteration. Attention is also given to the methods of preventing loss by improper storage or by the ravages of insects. Important drugs are studied under the microscope in cross section and in powder form.

[Three hours a week for one term.]

PHILOSOPHY

I.

(*a*) PHYSIOLOGICAL PSYCHOLOGY. This course is a fairly comprehensive treatment of the physical basis of consciousness.

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(*b*) EXPERIMENTAL AND DESCRIPTIVE PSYCHOLOGY. The primary laws of consciousness; psycho-physical methods and results.

(*c*) RATIONAL PSYCHOLOGY. The problems of the mind. Nature, origin and destiny of the soul.

[Courses *a*, *b*, and *c* are consecutive. Lectures three hours a week for two terms.]

(*d*) LABORATORY EXERCISES. Experiments will be conducted with special reference to their value as aids to introspection. *Sanford's Manual of Experimental Psychology, Tichener's Experimental Psychology, Vol. I.*

[One hour a week for two terms.]

II.

(*a*) ELEMENTS OF EPISTEMOLOGY. A study of the Scholastic theory of knowledge in relation to the teachings of Descartes, Leibnitz, Locke, Berkeley, Hume, Kant and Spencer.

(This course is intended to be introductory to Logic and General Metaphysics and will be given at the beginning of the year during the time prescribed for these studies.

(*b*) LOGIC. *Hyslop's Elements of Logic.*

[Two hours each week for two terms.]

(*c*) GENERAL METAPHYSICS. Transcendental concepts: their value in different systems of philosophy.

[Two hours a week for one term.]

(*d*) COSMOLOGY. The fundamental concepts of the natural sciences in relation to Thomistic philosophy.

[One hour a week for one term.]

(*e*) THEODICY. The existence of God; His attributes; His presence in the universe.

[One hour a week for one term.]

(*f*) STUDENT DISCUSSIONS. From time to time throughout the year students will be required to read

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and discuss papers on various subjects in the field of philosophic inquiry.

III.

(*a*) ETHICS. The theory of morals, with special reference to practical problems.

[Four hours a week for one term.]

(*b*) OUTLINES OF THE HISTORY OF PHILOSOPHY. *Turner's History of Philosophy.*

[Four hours a week for one term.]

IV.

GRADUATE WORK IN PHILOSOPHY. Graduate work in the department of philosophy, leading to the degree of Master or Doctor, may be undertaken by students who have pursued the courses described above. Candidates who have made undergraduate studies elsewhere must give evidence of ability to begin specializing at once. In the first and second years, research work will be conducted in the seminar and the psychological laboratory. In the last year, students will have the benefit of frequent consultation with the professors.

PHYSICS

I.

(*a*) PHYSICS. Instruction in Physics is given by lectures and recitations in which the general laws of mechanics, heat, acoustics, optics, electricity and magnetism are presented. The course is intended to meet the needs of those who desire a general knowledge of the subject, as well as to lay the foundations for advanced work. Particular attention is paid to the correct statement of principles, so that in his advanced work the student will have nothing to unlearn or relearn. Textbook, *Carhart and Chute.*

[Three hours a week for two terms.]

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(*b*) THE LABORATORY WORK of this course consists of a series of experiments which verify and apply practically the fundamental principles of physics. The student also receives instruction in the use and careful handling of apparatus, accurate observation, and correct deduction of results. Neat and concise reports of all experiments are kept by each student and form the basis for the grades in his work.

[Two hours a week for two terms.]

II.

GENERAL PHYSICS. In this course there is a more extended treatment of the same subjects than is given in Course I. Mathematical principles are applied to physical phenomena. Special attention is paid to accuracy in the mathematical work and in the statements of the principles involved. Lectures and recitations. Text-book, *Hastings and Beach.*

[Three hours a week for two terms.]

III.

PHYSICAL PROBLEMS. The application of mathematics in physical work. Measurements of length, mass and time. Work in mechanics, heat, light, sound, electricity and magnetism. The work is done in the laboratory and the student is taught to depend on his own resources and to check his results.

[Two laboratory hours a week for two terms.]

IV.

PHYSICAL LABORATORY. Special advanced work in heat, light, mechanics, sound, electricity, and magnetism. Accuracy in observations and in the calculation and recording of the results is required. Students may m

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specialize here according to the program which they are following. This course must be preceded by Courses II. and III.

[Three hours a week for two terms.]

PHYSIOLOGY

I.

(*a*) This course comprises lectures, recitations and demonstrations based upon *Thornton's Text-book of Human Physiology*. A liberal supply of models, charts and manikins are at hand to facilitate all demonstrations required.

(*b*) Laboratory work consisting of a selected number of experiments so arranged as to give the student a fair insight into modern experimental physiology.

(*c*) A limited number of microscopical preparations are required to be made by each student, and he must examine a set of typical preparations in order to acquire a fair knowledge of the microscopical structure of the tissues and organs of the human body.

(*d*) During the course special lectures will be given upon personal, domestic and municipal hygiene.

[Three recitations and one laboratory period for two terms.]

N. B.—Students of Pharmacy must take sections (*a*) and (*d*) and may select either (*b*) or (*c*).

II.

(*a*) This course comprises a complete study of human physiology such as is required of students of medicine. The lectures, recitations and demonstrations are based upon *Kirke's Handbook of Physiology* and

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Hall's Text-book of Physiology. The student will have free access to a copy of *The American Text-book of Physiology* for special reference.

(*b*) Laboratory work in experimental physiology. The manual used is *Hall's Experimental Physiology,* but the student will have free access to a number of other similar works.

[Four recitation hours and two laboratory periods for two terms.]

POLITICAL SCIENCE

ECONOMICS

I.

THE ELEMENTS OF ECONOMICS. A general survey of the subject based upon the study and discussion of *Seager's Introduction to Economics.*

[Four hours a week for two terms.]

II.

INDUSTRIAL HISTORY AND THE HISTORY OF ECONOMIC THOUGHT. Studies in the *Evolution of Industrial Society* by *Ely,* and in a *History of Political Economy* by *Ingram.*

[Four hours a week for one term.]

III.

(*a*) MONEY, CREDIT AND BANKING, with special treatment of the monetary experiences of the United States. The text-book used is *Money and Banking* by *White.*

[Four hours a week for one term.]

(*b*) PUBLIC FINANCE. History of finance, expenditure, revenue and debt of States, with special reference to American experience. Lectures and text.

[Four hours a week for one term.]

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IV.

DISTRIBUTION. Rent, interest, wages, profits. Special studies in land and labor problems and Socialism. The text-book used is *The Distribution of Wealth* by *Carver*. For readings *Labor Problems* by *Adams and Sumner*, *Progress and Poverty* by *George*, *Collectivism* by *Vandervelde*, *Contemporary Socialism* by *Rae*, and others.

[Four hours a week for one term.]

POLITICS

V.

THE ELEMENTS OF POLITICS. General survey. Text, *First Principles in Politics, Lilly.*

[Two hours a week for one term.]

VI.

AMERICAN GOVERNMENT AND POLITICS. Text, *Actual Government, Hart.*

[Two hours a week for one term.]

VII.

JURISPRUDENCE. A course covering (*a*) the outlines of the Science of Law. (*b*) The elements of International Law. (*c*) Lectures on selected topics of Roman and Canon Law. Lectures, readings, and examinations on required texts.

SOCIOLOGY

VIII.

THE ELEMENTS OF SOCIOLOGY. Text, *Elements of Sociology, Giddings.*

[Four hours a week for one term.]

IX.

GRADUATE WORK IN POLITICAL SCIENCE. Advanced courses in economics, politics and sociology are provided for graduate students who wish to receive the degree of Master or Doctor.

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ROMANCE LANGUAGES

These courses include the study of French, Spanish, Italian, Portuguese, Old French, Provençal.

The principal aim is to impart an accurate reading knowledge of literary works written in these languages. In the study, however, of Old French and Provençal, special attention will be paid to philosophy.

FRENCH

I.

Grammar with written and oral exercises; the inflection of nouns and adjectives, the use of all the pronouns, the conjugation of regular and the common irregular verbs; the correct use of moods and tenses; the essentials of French syntax, and the common idiomatic phrases. Reading of three of the following works: *La Tache du Petit Pierre, Mairet; Un Cas de Conscience, Gervais; La Main Malheureuse, Guerber; Sans Famille, Malot; Readings from French History, Super.*

[Five hours a week for two terms.]

II.

Advanced grammar with composition, study of idioms, memorizing. Dictations and conversations on practical topics, and careful reading of five of the following works: *Le Voyage de M. Perrichon, Labiche; Roman d'un Jeune Homme Pauvre, Feuillet; Fables Choisies, La Fontaine; Le Médecin Malgré Lui, Moliere; Le Cid, Corneille; Esther, Racine; Pages oubliées de Chateaubriand; La Question d'Argent, Dumas; Standard French Authors, Guerlac.*

[Five hours a week for two terms.]

III.

The study in this course is devoted chiefly to the prose and poetry of the nineteenth century and includes com-

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position, conversation, history and general view of French literature; besides a translation and criticism of the best writers, such as: *Causeries du Lundi, Ste. Beuve; On Rend l' Argent, Coppée; Hernani, Hugo; Méditations, Lamartine; Athalie, Racine; L'Avare, Moliére; Mlle. de la Seigliére, Sandeau; Les Origines de la France Contemporaine, Taine; Expédition de Bonaparte en Egypte, Thier; Ste. Elisabeth de Hongrie, Montalembert; Historie de la Littérature Francaise, Duval.*

[Four hours a week for two terms.]

N. B.—The works studied are not necessarily the same every year.

SPANISH

I.

General outlines of grammar with composition. Translation of easy tales from *Trueba, Fernon Caballero, Perez Escritch,* etc., with select fables of *Samaniego,* and *Iriate.*

[Five hours a week for two terms.]

II.

Spanish prose and poetry of the eighteenth and nineteenth centuries, with composition and the history of the literature of the period.

[Five hours a week for two terms.]

III.

Literature of the sixteenth and seventeenth centuries: *Cervantes, Calderon, Lope de Vega.* History of the literature of the period, with essays in Spanish.

[Four hours a week for two terms.]

IV.

Early Spanish. *El Poema del Cid.* History of the literature of the fifteenth century.

[Two hours a week for two terms.]

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ITALIAN

A two-year' course. The chief work of the courses is a critical study of *Dante's Divina Commedia.* Readings from *Tasso, Ariosto's Satires* and *Manzoni.*

PORTUGUESE

I.

Portuguese Conversation Grammar, Wall. Readings: *Perfil do marquez de Pombal, Camillo Castello Branco; Noveljas Historicas, Pinheiro Chagas; Lendas e narrativas, Herculano; Campo de flores, Joao de Deus.*

[Five hours a week for two terms.]

II.

Sermoes, Padre Antonio Vieira. Os Lusiadas, Camoes. History of Portuguese literature.

[Five hours a week for two terms.]

OLD FRENCH

Special attention will be paid to the laws underlying the formation of the French language from the popular Latin. For this purpose a work like *Brachet's Grammaire Historique* will be studied. It is under this point of view that Old French authors will be read, especially *La Chanson de Roland.*

PROVENCAL

Language and literature, with reading from the works of the Troubadours.

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ZOOLOGY

I.

This course comprises:

(*a*) Lectures, recitations and demonstrations based upon *Nicholson's Text-book of Zoology.*

(*b*) Lectures, readings and recitations based upon *Parker's Elementary Course in Biology.*

(*c*) Laboratory work on Invertebrata as outlined in *Pratt's Invertebrate Zoology,* and *Parker's Biology.*

(*d*) Mammalian Osteology including the study of one or two types of skeletons belonging to each order of mammalia. The work is outlined in *Kirsch's Elementary Course in Mammalian Osteology.*

[Two recitation hours and three laboratory periods for first term; three recitation hours and three laboratory periods for second term.]

II.

This course comprises:

(*a*) Recitations, lectures and demonstrations based upon *Hèrtwig's Manual of Zoology.*

(*b*) Laboratory work upon some Invertebrata in order to complete and supplement the work under (*c*) in Course I.

(*c*) Dissection and laboratory work upon one or two types in each of the classes of Vertebrata, viz: Fish, frog, newt, turtle, snake, mammal; the text-book used is *Pratt's Vertebrate Zoology.*

(*d*) A more extended study of mammalia with reference to the cat as outlined in *Davison's Mammalian Anatomy.*

(*e*) An outline of comparative Embryology of animals. Text-books, *Packard* and *Foster and Balfour.*

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PREPARATORY SCHOOL

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INSTRUCTORS IN THE PREPARATORY SCHOOL

REV. MICHAEL MATTHIAS OSWALD, C. S. C.,
Greek.

REV. JULIUS A. NIEUWLAND, C. S. C.,
Science.

REV. LEO J. HEISER, C. S. C.,
Science.

REV. GEORGE JOSEPH MARR, C. S. C.,
French.

REV. DOMINIC O'MALLEY, C. S. C.,
English.

JOHN BAPTIST DELAUNAY, C. S. C.,
French.

WALTER J. O'DONNELL, C. S. C.,
Latin.

BRO. PHIL NERI, C. S. C.,
Penmanship.

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BRO. CYPRIAN, C. S. C.,
Bookkeeping, Phonography, Typewriting.

BRO. NICHOLAS, C. S. C.,
Telegraphy.

WILLIAM LOGAN BENITZ, M. E. E. E.,
Mathematics.

EDWARD JOSEPH MAURUS, M. S.
Mathematics.

J. FRANK HANAN, LL. B.,
Civics.

CHARLES PETERSEN, A. M.,
German.

* WILLIAM MAHONEY, A. B., LL. B.,
Mathematics.

MICHAEL JOHN SHEA, A. M.,
English and Latin.

JOHN BAPTIST RENO, A. M., LL. B.,
Latin and History.

G. L. TREVINO, M. E. E. E.,
Spanish.

JACOB YOUNG, B. S. B.,
Science.

JOHN LORIMER WORDEN, B. S.,
Drawing.

* On leave of absence during the year 1907-08.

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GALLITZIN ALOYSIUS FARABAUGH, A. B., LL. B.,

English and History.

ARTHUR FUNK, B. S.,

Chemistry and Physics.

MICHAEL J. BROWN, A. M., LL. M., M. D.,

History and Mathematics.

J. ALOYSIUS DWAN, M. E. E. E.,

English and Mathematics.

BRO. NICHOLAS, C. S. C.,

Telegraphy.

DANIEL CORNELIUS DILLON, A. B.,

Latin and English.

WILLIAM E. FARRELL, A. B.,

English and Elocution.

FREDERICK WILLIAM McKINLEY, A. B.,

Mathematics.

THOMAS ALOYSIUS HEALY,

English, Geography, History.

JOHN L. TANNER, A. B.,

English and Mathematics.

JOHN BARRETT,

Mathematics.

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PREPARATORY SCHOOL

The University maintains a fully equipped Preparatory School under the same general government as the Colleges, but having its own special corps of instructors. The schedules of studies are arranged to meet the need of thorough preparation for collegiate work, and embrace courses which, while giving as wide an education as can be obtained in the very best High Schools, prepare students directly for the group of studies they may elect when entering the Freshman year. Five different programs of instruction are offered to students, each containing such special courses as directly meet the needs of the fifteen college groups, while all embrace common subjects which are indispensibly necessary in acquiring a fairly liberal education. The period of instruction covers four years.

The equipment and facilities for study in the Preparatory School are most complete. The laboratories are extensive and fully supplied with the latest improved appliances. The classes pursuing any subject are divided into sections, each containing a limited number of students. The sections are purposely limited in order that each student may receive close attention from the instructor in every recitation and laboratory period.

Examinations for admission are held at the opening of the School in September and embrace the subjects completed in the highest grade in the Grammar School. The expense for tuition, board, laundry, etc., will be found on pages 33 and 34. The following fees are special to the Preparatory School:

LABORATORY FEES

Science C.—Elementary Botany	$2.50
Science D.—Elementary Zoology	2.50
Science E.—Elementary Chemistry	5.00
Science F.—Elementary Physics	5.00

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Studies Peparatory for the Department of Classics in the College of Arts and Letters

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
FIRST TERM.					
Latin	5	A	Latin	5	A
English	5	A	English	5	A
History	4	A	History	4	A
Mathematics	5	A	Mathematics	5	B
Science	5	B	Science	5	D
SECOND YEAR.					
Latin	5	B	Latin	5	B
Greek	5	A	Greek	5	A
English	5	B	English	5	B
History	4	B	History	4	B
Mathematics	5	C	Mathematics	5	D
THIRD YEAR.					
Latin	5	C	Latin	5	C
Greek	5	B	English	5	B
English	5	C	Greek	5	C
History	4	C	History	4	C
Mathematics	5	E	Science	5	C
Civil Gov'm't	2	A	Civil Gov'm't	2	A
FOURTH YEAR.					
Latin	5	D	Latin	5	D
Greek	5	C	Greek	5	C
English	5	D	English	5	D
German or French	5	A	German or French	5	A
Science or Science	5	E	Science or Science	5	E
	5	F		5	F

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Studies Preparatory for the Department of Letters and the Department of History and Economics in the College of Arts and Letters.

FIRST YEAR.

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
Latin	5	A	Latin	5	A
English	5	A	English	5	A
History	4	A	History	4	A
Mathematics	5	A	Mathematics	5	B
Science	5	B	Science	5	D

SECOND TERM.

Latin	5	B	Latin	5	B
French or German	5	A	French or German	5	A
English	5	B	English	5	B
History	4	B	History	4	B
Mathematics	5	C	Mathematics	5	D

THIRD YEAR.

Latin	5	C	Latin	5	C
French or German	5	B	French or German	5	B
English	4	C	English	5	C
History	5	C	History	4	C
Mathematics	5	E	Mathematics	5	C
Civil Gov'm't	2	A	Civil Gov'm't	2	A

FOURTH YEAR.

Latin	5	D	Latin	5	D
French or German	4	C	French or German	4	C
English	5	D	English	5	D
German or French *	5	A	German or French *	5	A
Science or Science	5	E	Science or Science	5	E
	5	F		5	F

* Students who begin French A in the second year must begin German A in the fourth year.

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Studies Preparatory for the College of Science

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
FIRST YEAR.					
English	5	A	English	5	A
Mathematics	5	A	Mathematics	5	B
Latin	5	A	Latin	5	A
Civil Gov'm't	2	A	Civil Gov'm't	2	A
Science	5	A	Science	5	D
SECOND YEAR.					
English	5	B	English	5	B
Mathematics	5	C	Mathematics	5	D
History	4	A	History	4	A
Science	5	B	Science	5	C
Latin	5	B	Latin	5	B
THIRD YEAR.					
English	5	C	English	5	C
Mathematics	5	E	Mathematics	5	H
German	5	A	German	5	A
Science	5	E	Science	5	E
History	4	B	History	4	B
FOURTH YEAR.					
English	5	D	English	5	D
German	5	B	German	5	B
Science	5	F	Science	5	F
History	4	C	History	4	C
Drawing	3	A	Drawing	3	B

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Studies Preparatory for the Colleges of Engineering and Architecture

SUBJECTS FIRST TERM	Hrs. a Week	COURSE	SUBJECTS SECOND TERM	Hrs. a Week	COURSE
FIRST YEAR.					
English	5	A	English	5	A
Mathematics	5	A	Mathematics	5	B
History	4	A	History	4	A
Science	5	A	Science	5	D
*German	5	A	German	5	A
Civil Gov'm't	2	A	Civil Gov'm't	2	A
SECOND YEAR.					
English	5	B	English	5	B
Mathematics	5	C	Mathematics	5	D
History	4	B	History	4	B
Science	5	B	Science	5	C
German	5	B	German	5	B
THIRD YEAR.					
English	5	C	English	5	C
Mathematics	5	E	Mathematics	5	F
History	4	C	History	4	C
Science	5	E	Science	5	E
German	4	C	German	4	C
FOURTH YEAR.					
English	5	D	English	5	D
Mathematics	5	G	Mathematics	5	H
Drawing	3	A	Drawing	3	B
Science	5	F	Science	5	F

*French or Spanish may be substituted for German.

For Architecture Mechanical Drawing I, II, (see p. 131), are required.

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PREPARATORY COURSES

CIVIL GOVERNMENT

A.

This is a study of the science of government in connection with American institutions, and is intended to give the student some knowledge of the general principles of government and of the American Constitution. The subject begins by defining government; then is considered the object and necessity of government; origin of civil society; the principle of suffrage; different forms of government defined and compared; theories of representation. These topics necessarily are treated briefly, as the principal part of the course consists of a study of the Colonial government, the Articles of Confederation and their defects, the formation of the Constitution and its adoption. The study further comprises a critical analysis of each article and section of the American Constitution, thus enabling the student to acquire a clear conception of the division of powers of the National Government and the duties and responsibilities of each department. Text-book, *Government by State and Nation,* by *James and Sanford.*

[Two hours a week for two terms.]

DRAWING

A.

This work is based on the rudiments of drawing and consists of the training necessary for the hand and the eye. Sketching is also done from simple objects of various forms.

[Three hours a week for one term.]

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B.

Advanced work in sketching from objects such as the plaster cast of flowers and suitable ornaments which afford the study of light and shade.

[Three hours a week for one term.]

ENGLISH

A.

(*a*) *Meiklejohn's Art of Writing English,* with daily exercises in class. Two themes a week.

(*b*) The elements of versification. Scansion, one hour a week. Weekly exercises in writing verse. Memory work.

(*c*) Required reading: Robinson Crusoe, *Evangeline, Treasure Island, Snow-Bound, *The Sketch Book, *The Vision of Sir Launfal, *Poe's* Tales, *Poe's* Poems, *Julius Caesar, *The Merchant of Venice.

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

B.

(*a*) *Hill's Principles of Rhetoric, Part I.,* with daily exercises in class. Two themes a week.

(*b*) The simpler verse forms. Weekly exercises. Memory work.

(*c*) Required reading: Ivanhoe, *The Lady of the Lake, *The Vicar of Wakefield, *The Ancient Mariner, The Courtship of Miles Standish, *Silas Marner, *The Princess, *Macbeth, *As You Like It.

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

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C.

(*c*) *Hill's Principles of Rhetoric, Part II.*, with daily exercises in class. Weekly theme first term; fortnightly essay second term.

(*b*) Verse forms continued. Weekly exercises. Memory work.

(*c*) Required reading: *Sir Roger de Coverly, **Macaulay's* Essay on Addison, *The Golden Treasury of English Lyrics, **Macaulay's* Essay on Milton, **Milton's* Minor Poems, *A Midsummer Night's Dream, **Burke's* Speech on the Conciliation of America, **Webster's* Bunker Hill Oration, **Lincoln's* Gettysburg Oration, *King Lear.

(The works marked with an asterisk are to be studied; the others read.)

[Five hours a week for two terms.]

D.

(*a*) *Genung's The Working Principles of Rhetoric, Part I.*, with daily exercises in class. Fortnightly essay first term; monthly essay second term.

(*b*) Verse forms concluded. Weekly exercises. Memory work.

(*c*) Required reading: The House of the Seven Gables, *The Idylls of the King, Selections from Paradise Lost, *Cary's* Dante, **Gate's* Selections from Newman, *The Dream of Gerontius, *Pope's* Homer, *The Tempest, *Aubrey de Vere's* Poems, and *Hamlet.

(The works marked with an asterisk are to be studied; the others read.

[Five hours a week for two terms.]

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FRENCH

A.

Grammar with written and oral exercises; the inflection of nouns and adjectives, the use of all the pronouns, the conjugation of regular and the common irregular verbs; the correct use of moods and tenses, the essentials of French syntax, and the common idiomatic phrases. *Frazer and Squair's Grammar.* Reading three of the following: *La Tache du Petit Pierre, Mairet; Un Cas de Conscience, Gervais; La Main Malheureuse, Guerber; Sans Famille, Malot; Supers' Readings from French History.*

[Five hours a week for two terms.]

B.

Advanced grammar and composition, study of idioms, memorizing. *Frazer and Squair's Grammar.* Dictations and conversations are added on practical topics, and careful translation made of five of the following works: *Le Voyage de M. Perrichon, Labiche; Roman d'un Jeune Homme Pauvre, Feuillet; Fables choisies, La Fontaine; Le Medecin Malgre Lui, Moliere; Le Cid, Corneille; Esther, Racine; Pages oubliees de Chateaubriand; La Question d' Argent, Dumas; Standard French Authors, Guerlac.*

[Five hours a week for two terms.]

C.

The study of this course is devoted chiefly to the prose and poetry of the nineteenth century and includes composition, conversation, history and general view of French literature. Besides a reading and criticism of the best writers, such as: *Causeries du Lundi, Ste.*

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Beuve; On Rend l'Argent, Coppée; Hernani, Hugo; Meditations, Lamartine; Athalie, Racine; L'Avare, Molière; Mlle. de la Siegliére, Sandeau; Les Origines de la France Contemporaine, Taine; Expédition de Bonaparte en Egypte, Thier; Ste. Elizabeth de Hongrie, Montalembert; Historie de la Littérature Francaise, Duval.

[Four hours a week for two terms.]

N. B.—The works studied are not necessarily the same every year.

GREEK

A.

GRAMMAR. Etymology, *Goodell.*
LESSONS FOR BEGINNERS, *Morrison and Goodell.*
EPITOME OF THE NEW TESTAMENT, Part I., *Stoffel.*
[Five hours a week for two terms.]

B.

GRAMMAR. Etymology reviewed and Syntax begun. *Goodell.*
XENOPHON. Anabasis, Four Books, *Smith.*
COMPOSITION. Based on the Anabasis.
EPITOME OF THE NEW TESTAMENT, Part II., *Stoffel.*
[Five hours a week for two terms.]

C.

GRAMMAR. Completed.
XENOPHON. Selections from the Memorabilia.
PROSE COMPOSITION.
HOMER, *Iliad,* Six Books, *Seymour.*
EPITOME OF THE NEW TESTAMENT, Part III., *Stoffel.*
[Five hours a week for two terms.]

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GERMAN

A.

Grammar, *Bacon.* Translations from German into English of simple prose; translation of English exercises into German. Reading of short stories and selections from more difficult prose.

German Reader, *Miller and Wenkelbach.*

[Five hours a week for two terms.]

B.

Grammar, *Bacon.* Translation into German of narrative prose and selections from history.

Hermann and Dorothea, *Goethe;* Lichtenstein, *Hauff.*

[Five hours a week for two terms.]

C.

Grammar, *Bacon.* Sight reading of plays, poems and prose writings. Translation of selections from history and literature; original essays.

Minna von Barnhelm, *Lessing;* Best known poems *Heine;* Correspondence, *Schiller-Goethe.*

[Four hours a week for two terms.]

HISTORY

A.

ANCIENT HISTORY. *Meyers' Ancient History.* The Eastern Nations. The History of Greece and of the Empire of Alexander. The Story of Rome. The Establishment of the Empire, and the rise of Christianity. The Roman-German, or Transition Age.

[Four hours a week for one year.]

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B.

MEDIEVAL HISTORY. *Meyers' Medieval History.* The Barbarians and their Kingdoms. Mohammedanism and the Saracean Caliphs. The Holy Roman Empire. The Age of Revival. The Empire and the Papacy. The Great Schism and the rise of the Nations of Modern Europe.

[Four hours a week for one year.]

C.

MODERN HISTORY. *Fisher's Outlines of History.* The Renaissance. The Age of Discovery. The Protestant Reformation. The Power of Spain. The Strifes of France with Spain and Germany. The Age of Louis XVI., and the rise of Russia. The Spanish and Austrian Successions. The Empire of England. The American Revolution. The French Revolution and the Wars of Napoleon. The Revolutions and the Spirit of Nationality. The formation of Germany and Italy.

[Four hours a week for one year.]

LATIN

A.

GRAMMAR. Etymology, Bennett.

EXERCISES. Rudiments of Latin, *Reynolds.*

[Five hours a week for two terms.]

B.

GRAMMAR. Review of Etymology, Syntax, *Bennett.*

Caesar. Books I.—IV.

PROSE COMPOSITION. Based on *Caesar.*

[Five hours a week for two terms.]

C.

GRAMMAR. Syntax, *Bennett.*

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NEPOS. Selected Lives.

SALLUST. Catiline.

CICERO. Orations I.—III., against Catiline.

PROSE COMPOSITION. Based on authors read.

[Five hours a week for two terms.]

D.

GRAMMAR. Complete review.

CICERO. Three orations including *Pro Lege Manilia.*

OVID. Metamorphoses.

VERGIL. *Aeneid,* six books. The explanations cover peculiarity of syntax, figures, mythology.

PROSODY. Study of hexameter verse.

PROSE COMPOSITION. Based on *Cicero.*

[Five hours a week for two terms.]

MATHEMATICS

A.

ALGEBRA. This course for beginners in Algebra includes a study of the primary fundamental principles necessary to the courses which follow. The subjects dwelt upon in particular are factoring, highest common factor and least common multiple, which are afterwards applied in their relation to Fractions and the reduction of Complex Fractions. In as far as possible, concrete examples of their applications to kindred scientific subjects are applied by the teacher. Text-book *Wentworth's School Algebra.*

[Five hours a week for one term.]

B.

ALGEBRA. In this course the study of equations is begun and continued through equations of the first

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degree. Fractional equations, systems of simultaneous equations, involution, radicals and exponents complete the course, which is supplemented wherever possible with problems of practical application. Text-book, *Wentworth's School Algebra.*

[Five hours a week for one term.]

C.

ALGEBRA. This course begins with quadratic equations, pure and affected, followed by systems of simultaneous quadratic equations and those forms of radical equations of higher degree which may be solved by quadratic methods. Ratio and proportion, indeterminate equations, surds, imaginaries, inequalities, the progressions and the binomial theorem finish the work in this course. As in the preceding courses, special stress is placed upon the application of the theory to such examples as will show its application to elementary scientific subjects. Text-book, *Wentworth's College Algebra.*

[Five hours a week for one term.]

D.

GEOMETRY. This subject is completed as far as the end of plane geometry and includes a study of the theorems with proofs of exercises and original propositions. The habit of independent thinking is cultivated to some extent by the solution of special problems of concrete nature intended to exhibit the relation of the process studied to practical examples. Text-book, *Wentworth.*

[Five hours a week for one term.]

E.

GEOMETRY. The study of solid geometry is taken up in this term, the course being an extension of that of

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the preceding term. Planes, solid angles, polyhedrons, the cylinder, cone and sphere are all studied in detail and the solution of original exercises and propositions of application is made a feature of the course. Text-book, *Wentworth.*

[Five hours a week for one term.]

F.

ALGEBRA AND GEOMETRY. This course, which continues through one scholastic year, is designed especially for those students who wish to take up the study of Engineering. As this necessitates a thorough ground work in mathematics, the first half of the year is given to a review of algebra and geometry, three hours and two hours a week respectively. The most important theorems and subjects are again studied and a more comprehensive view of the subject is attained in the generalizing of many theorems and extending the range of others. Text-book, *Benitz.*

[Five hours a week for one term.]

G.

ALGEBRA AND GEOMETRY. The work of this term is entirely given up to an elementary exposition of the application of mathematics to scientific problems and to analysis. In lectures and class work actual problems representing existing and practical conditions are taken up, and the derivation of approximate formulæ and an elementary study of curves derived from experiment are included. Text-book, *Benitz.*

[Five hours a week for one term.]

H.

TRIGONOMETRY. A half year is given to this subject which includes both plane and spherical trigonmetry. The work done is the equivalent of that in most of the

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elementary text-books. Special attention is given to goniometry on account of its application to calculus, and examples of a concrete nature are abundantly supplied. Text-book, *Wentworth.*

[Five hours a week for one term.]

SCIENCE

A.

PHYSICAL GEOGRAPHY. An introductory and elementary study of the earth and its environments. The student will be led into a closer sympathy with the world about him. The various types of plant and animal life together with topographical and climatic conditions will be considered. Text-book, *Tarr.*

[Five hours a week for one term.]

B.

PHYSIOLOGY. Lectures, recitations and demonstrations with the stereopticon. The study of the human skeleton including the physiology and hygiene of the bones. The action, relation, structure and hygiene of muscles. The digestive, circulatory and excretory systems demonstrated by models and charts. The anatomy and structure of the nervous system and simple experiments on the same. Text-book, *Martin's Human Body.*

[Five hours a week for one term.]

C.

BOTANY. This course is designed for beginners in this subject; it includes a study of the higher plants with reference to structure of root, stem, leaf, flower and seed. An introduction to the lower forms of plant life and their classification is also given. Text-book, *Bastin's Elements of Botany.*

[Five hours a week for one term.]

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D.

ZOOLOGY. This course includes an introduction to the subject with studies of representative forms and their classification in the different groups of the animal kingdom. The subject is taught by recitations and laboratory work. Text-book, *Chapin and Rettger.*

[Five hours a week for one term.]

E.

(*a*) CHEMISTRY.—An introductory course of experimental lectures on familiar subjects such as water, the air and its constituents, common salt, etc., leading up to discussions of the more important elements and their properties, and the fundamental laws and phenomena of chemistry.

[Three hours a week for one year.]

(*b*) EXPERIMENTAL CHEMISTRY. A laboratory course to accompany Course (a). A series of exercises to be performed by each student, and having as their main object the cultivation of the student's powers of observation and faculty of inductive reasoning. These exercises comprise a study of the principal metallic elements, including their preparation, properties and more familiar compounds. The directions for each experiment are made as brief as possible; the observation of facts and the drawing of correct conclusions therefrom being left, so far as the nature of the experiment will permit, to the student.

[Two hours (four hours of actual work) each week for one year.]

F.

PHYSICS. Instruction in elementary physics is given by lectures and recitations in which the general laws of mechanics, heat, acoustics, optics, electricity and mag-

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netism are presented. The course is intended to meet the needs of those who desire a general knowledge of the subject, as well as to lay the foundation for advanced work. Particular attention is paid to the correct statement of principles so that in his advanced work the student will have nothing to unlearn or relearn.

[Three hours a week for one year.]

LABORATORY WORK of this course consists of a series of 70 experiments which verify and apply practically the fundamental principles of physics. The student also receives instruction in the use and careful handling of apparatus, accurate observation, and correct deduction of results. Neat and concise reports of all experiments are kept by each student and form the basis for the grades in this work.

[Two hours (four hours of actual work) each week for one year.]

GRAMMAR SCHOOL WORK

The courses of the Preparatory School outlined above are equivalent to those of a High School. There is also a Junior Preparatory Department in which are taught all the branches of a Grammar School,—the students having every opportunity for preparing themselves as rapidly as possible for High School work.

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COMMERCIAL SCHOOL

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THE COMMERCIAL SCHOOL

When the character and needs of the country are considered, courses in business will appear the most practical, and among the most important that an educational institution can offer.

Students, therefore, who have not the time or the means to take a complete college course in the classics or the sciences, will do well to enroll themselves in the Commercial School. No plan of study is more injudicious than a haphazard selection of such studies as an inexperienced young man may fancy. The training resulting from a fixed program of studies is of the utmost benefit to the student.

The commercial studies at Notre Dame have always received the most careful attention from the officers and from the Commercial Faculty. Notre Dame claims to give the students of this School a more complete business training than can be obtained in any purely commercial school. The authorities require that students taking this program—which may be completed in one year—should be at least 16 years of age and should have completed to years of a regular High School course or its equivalent. Special arrangements, however, will be made for young men who have had no High School training, but who may have had practical business or office experience. Should a student desire to pursue any other studies in which he may be interested and for which he has time, he will have liberty to do so. A diploma is issued to students completing all the courses of the program satisfactorily.

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PROGRAM OF INSTRUCTION

FIRST TERM.

I.

ARITHMETIC. Percentage; ratio and proportion; as far as involution and evolution. *Normal Union Arithmetic, Brooks.* Recitations daily.

II.

BOOKKEEPING. Preparatory instruction and definitions; initiatory sets by Double Entry; retailing by Double Entry; special practice in writing business paper and business forms. *New Complete Bookkeeping, Williams and Rogers.* Recitations daily.

III.

ENGLISH. Study of the theory of English composition; frequent exercises in theme writing. The principles of rhetoric. Recitations daily.

IV.

* PHONOGRAPHY. Recitations daily.

V.

TYPEWRITING. Three hours a week.

VI.

PENMANSHIP.

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*Phonography is free to commercial students in the final year of their program. For typewriting fees see page 34.

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SECOND TERM.

BOOKKEEPING. Single Entry; changing Single to Double Entry; retailing; wholesaling; shipping and commission; jobbing; manufacturing; installment and state agencies; joint stock companies; banking; railroading. *New Complete Bookkeeping, Williams and Rogers.* Four hours a week.

II.

ARITHMETIC. Percentage, ratio and proportion (reviewed); involution and evolution; arithmetical and geometrical series; higher percentage; mensuration; arithmetical analysis. *Higher Arithmetic, Brooks.* Recitations four hours a week.

III.

BUSINESS PRACTICE AND OFFICE WORK. Four hours a week.

IV.

BUSINESS CORRESPONDENCE. Two hours a week.

V.

COMMERCIAL LAW. General principles of contracts; agency; partnership; corporations; guaranty; sale of goods; negotiable paper. *Huffcut.* Two hours a week.

VI.

PHONOGRAPHY. Speed class. Recitations daily.

VII.

TYPEWRITING. Speed class. Daily.

VIII.

PENMANSHIP.

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SCHOOL OF MINIMS

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THE SCHOOL FOR MINIMS

For the care and training of boys under the age of thirteen years, there has been established a department to which the most scrupulous attention has always been paid by the authorities of the University—it is known as the School for Minims.

Thorough and comprehensive instruction in all the elementary branches of an English education is here imparted, together with a rudimentary knowledge of Latin, French and German and Algebra. Vocal Music and Drawing involve no extra charge. The pupils of this department are taught by Sisters of Holy Cross.

DISCIPLINE.

The following is the order of the day: Rising at 6:30 a. m., toilet, etc.; seven, breakfast, after which there is a short time given to exercise on the campus; eight, study; half-past nine, luncheon; ten, classes and study; a quarter to twelve, toilet; twelve, dinner, followed by recreation; half-past one, classes and study; three, recreation and luncheon; half-past four, classes and study; a quarter-past six, toilet; half-past six, supper and recreation; half-past eight, retiring. From this it may be seen that while the Minims devote almost seven hours a day to study, they are never more than two hours in succession in the class-room. The recreation and exercise in the fresh air after each period of study, unbend the mind and prepare the boys to return to their classes refreshed and ready for work.

The Minims are always under supervision during the hours of recreation as well as in the class-room and the study-hall. The presence, however, of the prefect is far from being a restraint on the amusement of the boys;

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for while it is the duty of the prefects to insist that their young charges shall always keep within the limits of the strictest propriety, they at the same time take part in all sports, organize games, and do everything in their power to foster the love for exercise. The playground is a broad, level, eight-acre field, well supplied with turning poles, swings, ladders, rings, parallel bars, and all other necessary gymnastic apparatus. That the boys make good use of them can be seen from their healthy, happy appearance, which invariably attracts the notice of visitors. Connected with the playground is a brick play-hall, one-hundred and sixty feet long and heated by steam. In this hall the boys play in rainy or cold weather.

The Sisters preside at the toilet; they clean and mend the clothing; see to all the needs and to the comfort and convenience of the Minims. Baths are taken every few days. Underclothing is changed regularly. Great care is taken that the boys be neatly dressed, and that the clothing be suitable for the season.

SOCIETIES.

There are two societies in the Minim Department, that of the Guardian Angels of the Sanctuary, which has for its object to supply servers for the Church services, and the Sorin Association, which has been established with a view to give the pupils a start, as early as possible, in elocution. The society is presided over by one of the professors, who finds it a pleasant duty to draw out the talent of these interesting young orators. Meetings are held once a week, after school hours. These meetings are a source of pleasure as well as of profit. The members prepare orignal compositions, deliver declamations, are trained to debate, etc. Only the best behaved and more advanced in studies are admitted to membership.

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To encourage this young literary society, a gold medal for elocution is annually awarded at Commencement to the most deserving member.

GENERAL REMARKS.

The discipline to which the Minims are subjected is much milder than that which is suited to students more advanced in age. Recourse is scarcely ever had to punishment. Those in charge endeavor to govern by kindness and gentleness, and by appealing to the boys' sense of honor. The names of all whose conduct and application to studies are satisfactory appear on the Roll of Honor and on the Roll of Class Honors. To find his name mentioned in these rolls, is found to be as great a reward for the deserving pupil, as its non-appearance is a punishment for the undeserving.

Then, too, there are gold medals awarded at the end of two full years to those whose deportment has been unexceptionable during that period. As this fact is made known to the Minim immediately after his entrance, he generally endeavors to shape his conduct with a view to receiving an Honor. The greatest care is taken to form their young hearts to habits of virtue, and to inculcate the practice of refined manners. Every effort is made to foster respect and affection for parents, to whom they are expected to write at least once a week.

Not the least of the advantages enjoyed by the Minims is their complete separation from the older students. A commodious building, known as Et. Edward's Hall, affording ample accommodations for over one hundred pupils, is devoted to their use. It is four stories in height, one-hundred and fifty feet long, and forty-five feet wide, heated by steam, supplied throughout with the Edison incandescent electric light, and provided with hot and cold water. The ceiling in the study-hall, class-rooms

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and sleeping apartments is fifteen feet high. The windows are large and numerous, affording abundant light and ventilation. The study-hall commands a charming view from each of its eleven large windows. It is tastefully decorated with statuary, pictures, plants, etc. Besides the pleasure the Minims derive from studying in this bright, cheerful hall, their tastes are cultured by coming into contact with objects so refining. Fronting the building is a handsome park, which, with its fountains, rare trees and flowers, adds not a little to the beauty of St. Edward's Hall, as well as to the happiness of its pupils.

These remarks, which have been made to satisfy parents and others who frequently write for more detailed information, will show that, while the Minims have every advantage to aid them in acquiring a foundation for future study, they have a home, where they enjoy the same ease and freedom that they would enjoy under the care of their mothers. For further information regarding the School for Minims apply for a special catalogue.

EXPENSES.

(For Students under Thirteen Years of Age.)

Matriculation Fee (first year only).....$ 10.00
Tuition, Board, Washing, Mending, Bed and Bedding, etc., per session of nearly ten months. 250.00
Payable in advance as follows:
FIRST PAYMENT,—On Entrance in September.
Matriculation Fee .....$ 10.00
Board and Tuition..... 150.00
Deposit on Book and Stationery Account..... 5.00
Gymnasium 2.50
Lecture and Concert Course Ticket..... 1.00
Music optional. For rates see below.
SECOND PAYMENT,—On January 15:
Balance on Board and Tuition.....$100.00

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The charge (per session of nearly ten months) for lessons on piano, violin, guitar or mandolin, and the use of the instrument, is fixed at $50.

Accounts are subject to sight draft, without notice, if not paid within ten days after they have been rendered.

Each pupil requires six shirts or waists, four suits of underwear, three night shirts, twelve pocket handkerchiefs, six pairs of stockings, six towels, two hats or caps, two pairs of shoes, a pair of overshoes, three suits of clothes, an overcoat, toilet set, blacking brush, soap, and a hand mirror. This direction concerning clothing is a suggestion, not a regulation. Any of the above supplies can be procured through the Students' Office at the University.

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List of Students

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LIST OF STUDENTS.

Matriculating during the Scholastic Year from September, 1907 to June, 1908.

Aguirre, Andreas Baca.....Vera Cruz, Mexico
Ahern, John Henry.....South Dakota
Alarcon, Julio.....Morelos, Mexico
Aldrete, George.....Guadalajara, Mexico
Allen, Walter Hopkins.....Illinois
Amadeus, B.....Indiana
Aman, Francis George.....Indiana
Anderson, Clarence J.....Indiana
Anderson, Robert Emmet.....Ohio
Ansoategui, Santiago Herman...Mayaguez, Puerto Rico
Armstrong, Henry Joseph.....Illinois
Armstrong, Philip John.....Illinois
Arnold, Arthur .....Illinois
Arnold, Wm. Simpson.....Massachusetts
Arrington, Norman Joy.....Illinois
Attley, George Emmett.....Illinois
Arvey, Edmond James.....Wisconsin
Ayala, Joaquin .....Guadalajara, Mexico
Ayres, Carl Stanford.....Indiana

Babbitt, Bertrand Henry.....Arizona
Babbitt, Edwin David.....Arizona
Baldwin, Jack Frank.....New Mexico
Bannon, Bernard Antonius.....Pennsylvania
Bannon, John Mackin.....Pennsylvania
Baradat, Enrique Andreas.....Cuba
Barclay, Francis Arthur.....Illinois
Barrenquy, Pedro .....Chinal, Mexico
Barsaloux, Paul Keeley.....Illinois
Bates, Chester .....Illinois
Bates, Paul .....Illinois
Batlle, Joaquin Louis.....Barcelona, Spain
Bayle, Wm. .....Ohio
Beane, George Alfred.....Illinois

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Becker, John Harold.....Illinois
Becklenberg, Harold Hubert.....Illinois
Becklenberg, John Love.....Illinois
Beckman, John Joseph.....Indiana
Beebe, Roy John.....Indiana
Beersum, Gerald .....Indiana
Beeson, Paul Allen.....Michigan
Bell, John William.....Illinois
Bennett, Joseph Alphonsus.....Ohio
Benoist, Charles Louis.....Missouri
Bensberg, Carl Francis.....Missouri
Bensberg, Wm. Joseph.....Missouri
Bentley, Conrad Michael.....Illinois
Bentley, Walter .....Illinois
Benz, John Joseph.....Pennsylvania
Benz, Othmar John.....Pennsylvania
Berkeley, Carroll Allen.....Missouri
Berry, Spire Bernard.....Oklahoma
Berteling, John Francis.....Indiana
Binz, Frank .....Illinois
Biro, Joseph Campo.....New York
Bishop, Harold Nowack.....New York
Biter, Francis Edward.....Pennsylvania
Blackman, Champ Odun.....Illinois
Blanco, Enrique Thomas.....San Juan, Puerto Rico
Bogy, Bernard Pratte.....Missouri
Bolln, Henry Joseph.....Wyoming
Bonham, Edwin Douglas.....New York
Boulton, John Allan.....Ohio
Bowen, Francis Reese.....Colorado
Bower, Jules Franklin.....Illinois
Bowles, John Heuse.....Illinois
Bowles, Raymond Harry.....Colorado
Boyd, Alfred James.....New York
Boyle, Joseph Justin.....Iowa
Bracken, Robert L.....Illinois
Brady, William Henry.....New York
Breen, Maurice John.....Iowa
Brengartner, Elmer Joseph.....Ohio
Brengartner, Ralph James.....Ohio
Brennan, Raymond .....New York
Brislin, John Jerome.....Pennsylvania
Brogan, John Francis.....Oregon
Broussard, Clyde Eloi.....Texas
Brown, Michael Joseph.....Indiana

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Bryson, George Devereux.....Illinois
Bryson, Ralph Oxley.....Illinois
Bucher, Edmund Victor.....Indiana
Buczkowski, John Stanislaus.....Indiana
Burdick, Harry Anthony.....Ohio
Burke, Cornelius James.....Indiana
Burke, John Dennis.....Michigan
Burke, William Joseph.....Illinois
Burns, Charles Hugh.....Texas
Burns, Francis .....Ohio
Burtt, Fidelis Norton.....Illinois
Burtt, Millard Marsh.....Illinois
Butler, Francis .....Illinois
Butler, John Patrick.....Indiana
Byrne, Paul Ryan.....New York

Caceres, Federico.....Peru, South America
Cagney, Harry Louis.....Illinois
Cagney, John Albert.....Illinois
Cagney, LeRoy .....Illinois
Cagney, Walter .....Illinois
Cahill, Edward .....Indiana
Cahill, James Lee.....Illinois
Cain, Ronald Charles.....Indiana
Call, Havens Howe.....Illinois
Callahan, Thomas Wood.....Indiana
Callicrate, Dominic Leo.....Indiana
Cantwell, Francis Xavier.....Illinois
Cantwell, Robert Emmett.....Illinois
Cantwell, Thomas Barry.....Illinois
Caparo, Angel .....Peru, South America
Cardenas, Jose Antonio.....Peru, South America
Carey, William Arthur.....Wisconsin
Carmody, Elmer .....Illinois
Carr, Harry Wm.....Illinois
Carroll, Frederick William.....Illinois
Carroll, George Henry.....Ohio
Carroll, Homer Peter.....Ohio
Carroll, Hugh .....Wisconsin
Carroll, William Manson.....Ohio
Cartwright, Marcus .....Tennessee
Carville, Edward Peter.....Nevada
Caso, Fernando.....Manati, Puerto Rico
Caso, Vicente .....Pueblo, Mexico
Castaneda, Ramon.....Pachuca, Mexico

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Centlivre, Carl Louis.....Indiana
Christie, Arthur James.....Illinois
Clark, Malachy Daniel.....Minnesota
Clasgens, Herbert William.....Illinois
Cleary, Edward Patrick.....Illinois
Cleary, Leo John.....Illinois
Cleary, Thomas Frederick.....Illinois
Clement, B.....Indiana
Clifford, John William.....Wisconsin
Clinton, Manus Paul.....Pennsylvania
Coad, Marcus Matthew.....Nebraska
Cody, William Francis.....Kentucky
Coffey, Raymond Thomas.....Iowa
Coggeshall, John .....Kentucky
Collazo, Ramon.....Manati, Puerto Rico
Collentine, Richard Joseph.....Wisconsin
Collier, Francis Thomas.....Quebec, Canada
Collins, Thomas Daniel.....Illinois
Comerford, Dean William.....Illinois
Comerford, George Louis.....Illinois
Comerford, John Martin.....Illinois
Concha, Manuel Francisco.....Peru, South America
Conlin, Wm. Thomas.....Minnesota
Connolly, Edward Joseph.....Illinois
Connolly, Raymond Aloysius.....Illinois
Conway, Daniel David.....New York
Cooke, Arthur John.....New York
Cooley, Willard Dean.....Iowa
Coppinger, Lucian Biggins.....Illinois
Corbett, James Joseph.....Illinois
Corbett, John Kiley.....Indiana
Corcoran, Wm. Joseph.....Missouri
Corn, Baizel Jay.....Indiana
Cortazar, Enrique.....Chihuahua, Mexico
Cortazar, Julio .....Chihuahua, Mexico
Cotter, William Edward.....Illinois
Courcier, John Laurence.....Ohio
Couttolenc, Luis .....Pueblo, Mexico
Cowie, George .....Wisconsin
Cowie, Lloyd Rice.....Wisconsin
Cox, Louis Charles.....Alabama
Coyne, Martin John.....Pennsylvania
Crawford, Peter Michael.....New York
Crepeau, Elton Benjamin.....Indiana
Cripe, Clarence Cyril.....Indiana

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Cull, Francis Xavier.....Ohio
Curren, Wm. Julius.....New Mexico
Curtis, Harry Albert.....Massachusetts
Czyzewski, Stephen .....Indiana

Daily, Gerald Marcellus.....Indiana
Daly, Albert Maxwell.....Indiana
Daly, James Wm.....New York
Dana, Frederick Charles.....Wisconsin
Daniels, Bernard Elmer.....Illinois
Dant, John Procter.....Kentucky
Darr, Charles Leo.....Ohio
Darst, Wm. James.....Illinois
Davila, Manuel.....Manati, Puerto Rico
Davis, Howard Clayton.....Indiana
Davis, Robert Agnew.....Michigan
Davison, McIntosh .....Illinois
Dawson, Charles Edward.....Indiana
Dean, John Richmond.....Illinois
Decker, Marshall Joseph.....Illinois
Deckman, George .....Ohio
De Clerq, Arthur Ernest.....Michigan
Dee, Samuel Allerton.....Illinois
Deery, James Edward.....Indiana
Degnan, Walter John.....Ohio
Delana, Edward Keenan.....Illinois
Deline, Alfred Dewey.....Michigan
De Lone, Eugene Martin.....Pennsylvania
De Lone, Harry Martin.....Pennsylvania
Del Valle, Jose.....Havana, Cuba
Derrick, Francis.....Pennsylvania
Devers, John Aloysius.....Pennsylvania
Devine, James Joseph.....New York
Devine, John Francis.....Illinois
Devitt, Joseph Ryan.....Ohio
Diener, John Vernon.....Wisconsin
Dillon, Daniel Cornelius.....Pennsylvania
Dillon, Edward Joseph.....Pennsylvania
Dillon, Francis Joseph.....Pennsylvania
Ditton, James Hawkins.....Indiana
Dillon, Lee Summerville.....Colorado
Dillon, Malcolm White.....Colorado
Dillon, Stephen Vincent.....Pennsylvania
Dionne, Louis Albert.....Wisconsin
Dixon, Carmo Del.....Ohio

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Dixon, Joseph Thomas.....Pennsylvania
Dixon, Maurice Edwin.....Indiana
D'Landero, Pedro Antonio.....Pachuca, Mexico
Dodge, Harry Daniel.....Iowa
Dolan, Samuel Michael.....Oregon
Dolan, William Thomas.....Missouri
Dominguez, Mario Seferino.....Vera Cruz, Mexico
Donahue, Ferol John.....Indiana
Donahue, Joseph Nicholas.....Indiana
Donahue, Wm. Matthew.....Indiana
Donovan, Cornelius James.....Massachusetts
Donovan, Paul Joseph.....Illinois
Donovan, Rupert Donnelly.....Illinois
Doorley, Francis Jerome.....Ohio
Dougherty, Raymond Martin.....Iowa
Downing, Wm. Pointelle.....Illinois
Doyle, Bernard Ephraim.....Illinois
Duarte, Adolfo Manuel.....Columbia, South America
Dubail, Donald Edward.....Indiana
Dubuc, John Arthur.....Connecticut
Duffey, John Francis.....Wisconsin
Duffy, Daniel Franklin.....Illinois
Duffy, Henry Aloysius.....Illinois
Duffy, Mark Matthew.....Wisconsin
Duffy, Wm. Ambrose.....Pennsylvania
Dugan, William Francis.....Minnesota
Dunbar, Thomas Kennedy.....Illinois
Duncan, Walter James.....Illinois
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Dwyer, Hurlburt.....New York

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Flaherty, James Joseph.....Illinois
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Funk, Elmo Ambrose.....Indiana
Furniss, Thomas James.....Wisconsin

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O'Connor, Arthur Joseph ..... Iowa
O'Donnell, Thos. Raymond ..... Indiana
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O'Farrell, Charles Whitty ..... Illinois
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O'Flynn, James Baldwin ..... Montana
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Ohmer, Henry Beckman ..... Ohio
Ohmer, Robert Fasold ..... Ohio
O'Leary, James ..... Illinois
Oliver, William Ronald ..... New Merico
Olston, Francis Michael ..... West Virginia
O'Neil, John Paul ..... Pennsylvania
Orminski, John Charles ..... Illinois
Oshe, Marcellus Mathew ..... Ohio
O'Shea, Dennis Aloysius ..... Illinois
O'Shea, Maurice Joseph ..... Illinois
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Osborne, Lee ..... Illinois
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Prendergast, Hugh Wm.....Missouri
Preston, Norman Charles.....New York
Probst, Rudolph Otto.....Indiana

Qualmann, Paul Henry.....Indiana
Quigley, Henry Thomas.....Kansas
Quinlan, James Joseph.....Illinois
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Quinn, Edmond John.....New York
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Quintanilla, Ignacio.....Mexico City

Radel, Edward Herman.....New Jersey
Rafferty, Harry Thomas.....Illinois
Railton, Bert Aloysius.....Illinois
Rainey, Carl Raymond.....Illinois
Rangel, Manuel.....Puebla, Mexico
Ratcliffe, Moyse .....Texas
Rath, Raymond August.....New York
Redding, James Francis.....New York
Reed, Richard Joseph.....Illinois
Rempe, George Aloysius.....Illinois
Rempe, Harold Raymond.....Illinois
Rempe, Lester Wm.....Illinois
Reyher, Clyde Herbert.....Indiana
Reynolds, Lawrence .....Wisconsin
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San Pedro, Manuel Rodriguez.Consolacion del Sur, Cuba
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Scanlan, Ambrose James.....New York
Scanlon, Francis Aloysius.....New York
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Sixty-Fourth Annual Commencement

Degrees, Honors, Prize Medals

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CONFERRING OF DEGREES.

THE DEGREE OF DOCTOR OF LAWS was conferred on

The Rev. Gilbert Patrick Jennings, Cleveland, Ohio.
Brev. Brig. Gen. Robert Wallace Healy, Chattanooga, Tenn.
The Hon. Charles Patrick Neill, Washington, D. C.
Judge James O'Brien, Caledonia, Minn.

THE DEGREE OF MASTER OF ARTS was conferred on

Michael Joseph Brown, Philadelphia, Pa.
Francis Thomas Collier, Quebec, Canada.
Robert Adam Kasper, Evanston, Ill.
Frederick William McKinley, Clermont, Ia.
Walter James O'Donnell, Notre Dame, Ind.
John Francis Shea, Holyoke, Mass.

THE DEGREE OF MASTER OF LAWS was conferred on

Michael Joseph Brown, Philadelphia, Pa.
J. Frank Hanan, La Grange, Indiana.
T. Paul McGannon, Corning, N. Y.

THE DEGREE OF BACHELOR OF ARTS was conferred on

Francis Derrick, Oil City, Pa.
Raymond Augustine Rath, Hempstead, Long Island, N. Y.
Robert Lawrence Saley, Hampton, Iowa.
Francis Aloysius Zink, Canton, Ohio.

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THE DEGREE OF BACHELOR OF LETTERS was conferred on

Joseph Justin Boyle, Rockwell, Iowa.
Edward Michael Kennedy, Scottdale, Pa.
William Peter Lennartz, Fort Recovery, O.
Francis Thomas Maher, Kokomo, Ind.
Varnum Augustine Parish, Momence, Ill.
James Joseph Quinlan, Chicago, Ill.

THE DEGREE OF BACHELOR OF PHILOSOPHY was conferred on

James Joseph Corbett, Chicago, Ill.
Francis Xavier Cull, Miamisburg, Ohio.
James Joseph Flaherty, Peru, Ill.
Leslie John McPartlin, Oshkosh, Wis.
John William Roach, Muscatine, Iowa.

THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGY was conferred on

Jacob Philip Young, Huntington, Ind.

THE DEGREE OF BACHELOR OF SCIENCE IN ARCHITECTURE was conferred on

Rolland Adelsperger, South Bend, Ind.

THE DEGREE OF CIVIL ENGINEER was conferred on

John Francis Berteling, South Bend, Ind.
Dominic Leo Callicrate, South Bend, Ind.
Angel Joseph Caparo, Peru, South America.
Marcellinus G. Rubio, Sancti Spiritus, Cuba.

THE DEGREE OF MECHANICAL ENGINEER was conferred on

Robert Emmet Anderson, Cincinnati, Ohio.
Charles Herman Johnson, St. Paul, Minn.
John Joseph Scales, Brooklyn, New York.
Rufus William Waldorf, Mendota, Illinois.

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THE DEGREE OF ELECTRICAL ENGINEER was conferred on

Simon Anthony O'Brien, New York City.
Joseph Daniel Sinnott, Astoria, Oregon.
Gustavo Lorenzo Trevino, Monterey, Mexico.

THE DEGREE OF BACHELOR OF LAWS was conferred on

Robert Louis Bracken, Polo, Illinois.
John Francis Brogan, The Dalles, Oregon.
Harry Albert Curtis, Newburyport, Mass.
Howard Clayton Davis, Hanna, Indiana.
Rupert Donnelly Donovan, Woodstock, Ill.
Max John Jurschek, San Antonio, Texas.
Le Roy Joseph Keach, Indianapolis, Ind.
Clarence Willard May, Suffield, Ohio.
Francis Elmer Munson, Mendota, Illinois.
Palmer Honus McIntyre, Hanover, Illinois.
George William Sprenger, Peoria, Ill.

THE DEGREE OF GRADUATE IN PHARMACY was conferred on

Hiram G. McCarthy, Mackinac Island, Mich.

THE DEGREE OF PHARMACEUTICAL CHEMIST was conferred on

Richard Bruce Wilson, Chicago, Ill.

CERTIFICATES FOR THE SHORT PROGRAM IN ELECTRICAL ENGINEERING were awarded to

Joaquin Luis Batlle, Barcelona, Spain.
Adolph Stephen Mueller, Denver, Colo.
James Anthony Toohey, Binghamton, N. Y.
Leo John Welsh, Williamsfield, Ill.
Henry Edward Weis, Wausau, Wis.

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CERTIFICATES FOR THE SHORT PROGRAM IN MECHANICAL ENGINEERING were awarded to

Santiago Herman Ansoategui, Mayaguez, Puerto Rico.
Henry Anthony Burdick, Cincinnati, O.
Paul Allen Beeson, Three Oaks, Mich.
John William Murphy, Corning, New York.

COMMERCIAL DIPLOMAS were awarded to

Bernard Anthony Bannon, Crafton, Pa.
John Jerome Brislin, Homestead, Pa.
Walter John Degnan, Toledo, O.
Oliver Laurent Gehant, West Brooklyn, Ill.
José Luis Gonzalez, Peru, South America.
Francis Bernard McBride, Allegheny, Pa.
Rafael Rousseau, Guantanamo, Cuba.
John Louis Slavin, Hebron, Ill.
Thomas Francis Smyth, Ogden, Utah.
Lyle Samuel Sours, Watertown, S. Dak.

PRIZE MEDALS.

THE QUAN GOLD MEDAL, presented by the late William J. Quan, of Chicago, for the student having the best record in the Classical Program, Senior Year, and a money prize of twenty-five dollars, gift of Mr. Henry W. Quan, in memory of his deceased father, were awarded to

Francis Derrick, Oil City, Pa.

THE MASON GOLD MEDAL, presented by Mr. George Mason, of Chicago, for the student of Carroll Hall having the best record for the scholastic year was awarded to

Theodore Susen, Chicago, Illinois.

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THE MEEHAN GOLD MEDAL FOR ENGLISH ESSAYS, presented by Mrs. Eleanor Meehan, Covington, Kentucky, was awarded to

Francis Thomas Maher, Kokomo, Ind.

THE BREEN GOLD MEDAL FOR ORATORY, presented by the Hon. William P. Breen of the Class of '77, was awarded to

Joseph Justin Boyle, Rockwell, Iowa.

THE ELLSWORTH C. HUGHES GOLD MEDAL, presented by Mr. A. S. Hughes, of Denver, Colorado, for the best record for four years in the Civil Engineering Program, was awarded to

Angel Caparo, Peru, South America.

THE FITZSIMMONS GOLD MEDAL FOR CHRISTIAN DOCTRINE IN MORAL A, presented by the Rev. M. J. Fitzsimmons, Chicago, was awarded to

Thomas Frederick Cleary, Gridley, Illinois.

THE QUINN GOLD MEDAL FOR CHRISTIAN DOCTRINE IN MORAL B, presented by the Rev. John J. Quinn, of the Class of '83, was awarded to

John Carl Tully, El Paso, Illinois.

THE BARRY GOLD MEDAL for Christian Doctrine in Carroll Hall, presented by the Rev. F. J. Barry, of Chicago, was awarded to

Henry Joseph Armstrong, Chicago, Illinois.

SEVENTY-FIVE DOLLARS IN GOLD for debating work, presented by Mr. J. V. Clark, of Chicago, was awarded as follows:

Thirty-five Dollars to

William Peter Lennartz, Fort Recovery, O.

Twenty-five Dollars to

Francis Comerford Walker, Butte, Mont.

Fifteen Dollars to

John Bernard Kanaley, Weedsport, N. Y.

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TEN DOLLARS IN GOLD for Junior Oratory, presented by Mr. James V. O'Donnell, of the Class of '89, was awarded to

Richard Joseph Collentine, Monroe, Wis.

TEN DOLLARS IN GOLD for Sophomore Oratory, presented by Mr. John S. Hummer, of the Class of '91, was awarded to

George Joseph Finnigan, Malone, N. Y.

TEN DOLLARS IN GOLD for Freshman Oratory, presented by Mr. Hugh O'Neill, of the Class of '91, was awarded to

Thomas Aquinas Lahey, Michigan City, Ind.

TEN DOLLARS IN GOLD for Preparatory Oratory, presented by Mr. Clement C. Mitchell, of the Class of '04, was awarded to

Charles Joseph Flynn, Lynn, Mass.

THE COMMERCIAL GOLD MEDAL for the best record in the Commercial School was awarded to

Thomas Francis Smyth, Ogden, Utah.

ONE *ex aequo* was also awarded to

Oliver Laurent Gehant, West Brooklyn, Ill.

THE O'BRIEN GOLD MEDAL for the best record in Preparatory Latin, the gift of the Rev. Terence A. O'Brien, of Chicago, was awarded to

John Edward Ruof, Lancaster, Pa.

THE BARRY ELOCUTION GOLD MEDAL, presented by the Hon. P. T. Barry, of Chicago, was awarded to

Claude A. Sorg, New York City.

THE JOSEPH A. LYONS GOLD MEDAL for Elocution, was awarded to

Raymond Harry Bowles, Littleton, Colo.

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DEPORTMENT PRIZES.

[Gold Medals for Deportment are awarded to pupils of Carroll Hall who have spent two full years at Notre Dame and whose deportment during the whole time has been unexceptionable.]

[Certificates are awarded to those pupils of Carroll Hall who have followed the courses of the University at least two terms, and whose deportment during the whole time has been unexceptionable.]

CARROLL HALL.

DEPORTMENT GOLD MEDALS were awarded to

Julius Joseph Lee, Salt Lake City, Utah.
Jeremiah A. McCarthy, Logansport, Ind.
Ralph William Newton, Glen Ellyn, Ill.
Joseph G. Sheehan, Winnetka, Ill. (Renewal).

CERTIFICATES FOR DEPORTMENT were awarded to

Andreas Baca Aguirre, Vera Cruz, Mexico.
Henry Joseph Armstrong, Chicago, Illinois.
Julio Alarcon, Cuernavaca, Morelas, Mex.
George Aldrete, Guadalajara, Mexico.
Julio Cortazar, Chihuahua, Mexico.
Arthur James Christie, Chicago, Ill.
William Francis Cody, Covington, Ky.
William Pointelle Downing, Decatur, Ill.
Daniel Franklin Duffy, Chicago, Ill.
Edward Keenan Delana, Cortland, Ill.
John Martin Fordyce, Butternut, Wis.
Thomas James Furniss, Superior, Wis.
Juan Garcia Gonzales, Satillo, Mexico.
John Raymond Kavanaugh, Chicago, Ill.
Arthur Bernard Larkin, Chicago, Illinois.
George A. Milius, New York City.
Charles Lillis Murdock, South Bend, Ind.
Bernard Francis McLain, Elizabeth, N. J.
James Shaw McIver, New York City.
John Francis Nugent, Elizabeth, N. J.
William Ronald Oliver, Roswell, N. M.
George Brunuo Sippel, Chicago, Ill.
Theodore Susen, Chicago, Ill.
John Louis Slavin, Hebron, Ill.
Joseph Oscar Trevino, Chihuahua, Mexico.
Cyril John Tyler, Elyria, Ohio.
Martin Emmett Walter, Mt. Carmel, Ill.

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INDEX

Administration Building, The. 12
Admission to the Colleges.... .....19, 38, 50, 58, 64, 86
Advanced Standing 19, 97
Alumni Association Officers...228
Anatomy, Courses in.....45, 106
Architecture, The College of.. 84
Architecture, Courses in.....106
Arts and Letters, The College of..... 36
Astronomy, Courses in.....111
Athletics 17, 29

Bachelors' Degrees 20
Bacteriology, Course in.....111
Biology, Program in..... 56
Biological Laboratories 44
Board of Trustees..... 4
Board and Lodging..... 33
Botany, Courses in.....112
Botanical Laboratories 44
Breen Medal 26
Brownson Hall 16
Buildings 12

Calendar 3
Carroll Scholarship 24
Carroll Hall 16
Charter 11
Chemical Laboratories 14, 46
Chemistry, The Department of 55
Chemistry, Courses in.....114
Christian Doctrine, Courses in.119
Church, The 12
Civil Engineering, The Department of 65
Civil Engineering, Courses in.120
Civil Government, Course in..182
Classics, The Department of.. 40

Colleges:
College of Arts and Letters 36
College of Architecture.... 84
College of Engineering.... 62
College of Law..... 96
College of Science..... 44

Commercial School 196
Commencement 231

Concerts and Lectures.....29, 30
Corby Hall 15
Courses of Instruction...105, 182

Debating Prize 27
Degrees 20, 232
Directory of the University... 2
Directors of Halls..... 6
Discipline 27
Doctor of Philosophy, The Degree of 22
Dormitories 15, 16
Drawing, Courses in.127, 130, 182

Economics, The Department of 42
Economics, Courses in.....167
Elocution, Courses in.....135
Elocution Medals 26
Electrical Engineering, The Department of 76
Electrical Engineering, Courses in 133
Engineering Hall 14
Engineering, The College of.. 62
English, Courses in.....137, 183
Entrance Requirements..... .....38, 50, 58, 64, 86, 97
Ethics, Courses in.....164
Executive Officers 5
Expenses.....33, 34, 203

Faculty 7, 174
Ford Scholarships 24
French, Courses in..169, 171, 185

Geology, Courses in.....139
German, Courses in.....140, 187
Graduate Courses.104, 114, 119, 139, 143, 145, 148, 150, 154, 168
Grammar School.....194, 200
Greek, Courses in.....141, 186
Gymnasium 17

History and Economics, The Department of 42
History, Courses in.....144, 187
Historical Sketch of the University..... 11
Honors, and Prizes.....235

Digitized by Google

Hospital 17, 34
Hughes Medal 26

Infirmary 17
Instruction, System of. 18
Instructors in the Preparatory School. 174
Italian, Courses in. 171

Johnson Scholarship. 24

Laboratory Fees. 52, 54, 56, 59, 63, 177
Laboratories 37, 44, 45, 46, 48, 65, 68, 69, 76, 86
Latin, Courses in. 146, 188
Law, The College of. 96
Law, Courses in. 102
Lectures and Concerts. 29, 30
Letters, The Department of. . . 41
Library, The Main. 12
Libraries, Department. 37, 44, 48, 59, 72, 101
List of Students. 206
Lodging, Board and. 33
Local Clubs 230
Logic, Courses in. 163

Mason Medal 25
Masters' Degrees 21
Mathematics, Courses in. . 148, 189
Meehan Medal 25
Mechanical Engineering, The Department of 68
Mechanical Engineering, Courses in 151
Medals, Prize. 25, 235
Metaphysics, Courses in. 163
Microscopy, Courses in. 156
Minims, The School for. 200
Museum 13
Music Hall 13
Music, Courses in. 157

Observatory 15
Officers of the University. 5
Oratory, Courses in. 136

Pharmacy, The Department of 58
Pharmacy, Courses in. 160
Philosophy, Courses in. 162
Physical Laboratory 48
Physics, Courses in. 164
Physiology, Courses in. 166
Political Science, Courses in. . 167
Politics, Courses in. 168
Portuguese, Courses in. 171
Preparatory School. 173, 177
Prizes 25, 230
Professors 7
Program of Studies. 40, 41, 42, 53, 55, 57, 60, 67, 73, 75, 80, 82, 92, 93, 94, 103, 178, 179, 180, 181, 197
Provencal, Courses in. 171
Psychology, Courses in. 162
Psychological Laboratory. 37

Quan Medal. 25

Regulations Governing Admission to the Colleges. 19
Romance Languages, Courses in 169

Scholarships 23
Science Hall 13
Science, The College of. 44
Science, Program of General. . 52
Science, Courses in Elementary 192
Short Programs in
Architecture 91
Electrical Engineering 81
Mechanical Engineering . . 74
Shopwork, Courses in. 155
Sociology, Courses in. 168
Societies 31, 201
Sorin Hall 15
Spanish, Courses in. 170
Special Students. 23, 97
Students, List of. 206
St. Joseph Hall. 16
System of Instruction. 18

Title (Legal) of the University 11
Theater, The University. 13
Trustees, Board of. 4
Tuition Fees 33

University of Notre Dame. . . . 11

Washington Hall 13

Zoology, Courses in. 172

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